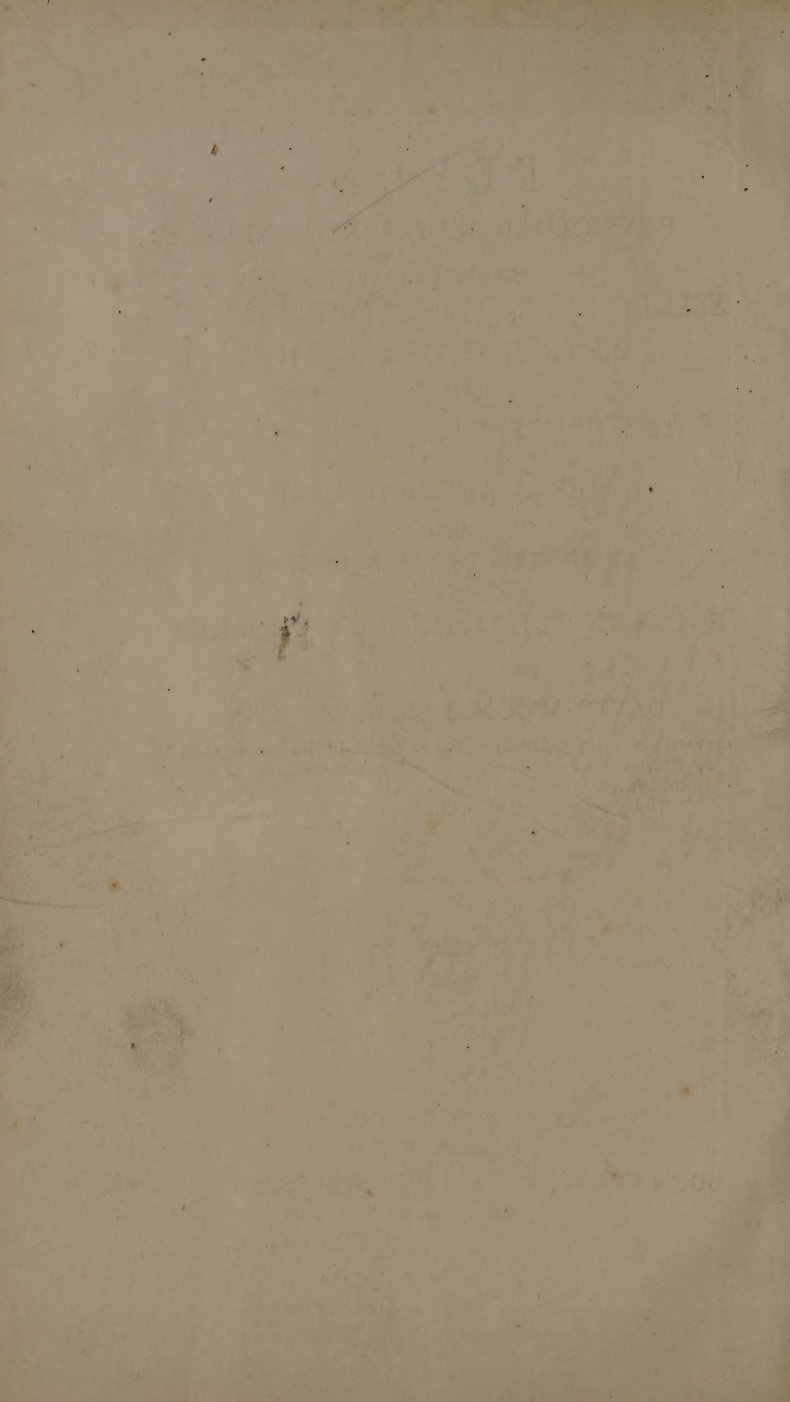




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# FEVER

PHYSIOLOGICALLY CONSIDERED;

CONSIDERATIONS ON

YELLOW FEVER, TYPHUS FEVER, PLAGUE,  
CHOLERA, AND SEA-SCURVY;

ALSO

THE QUESTIONS OF CONTAGION,

AND

THE QUARANTINE LAWS;

WITH

AN ADDRESS TO THE PUBLIC, &c.

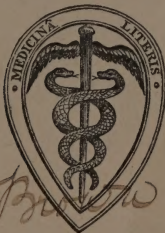
ON THE

POPULAR TREATMENT OF CHOLERA.

BY

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RESOURCES OF PORTO-RICO.



*Henry J. B. ...*

Φοβος ὑγίης ουδεποτε νοσεί.

LONDON:

JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCXLVI.



LONDON:

G. J. PALMER, SAVOY STREET, STRAND.

BUT flesh with the *life* thereof, which is the *blood* thereof, shall ye not eat.—Gen. chap. ix. x. v. 4. And, being in an agony, he prayed more earnestly; and his *sweat* was as it were *reat drops of blood* falling down to the ground.—St. Luke, chap. xxii. v. 44. But one of the soldiers pierced his side, and forthwith came thereout *blood and water*.—St. John, chap. xix. v. 34. And almost all things are by the law *purged with blood*; and without *shedding of blood is no remission*.—Hebrews, chap. ix. v. 22. For there are three that bear *record in heaven*, the Father, the Word, and the *Holy Ghost*; and these *three are one*. And there are three that bear *witness on earth*, the *Spirit*, the *water*, and the *blood*, and these three agree in one.—1 John, chap. v. ver. 7, 8.

Medicina omnium artium præclarissima est; verum propter Ignorantiam eorum qui eam exercent, et ob Vulgi Ruditatem, quod tales pro Medicis judicat, et habet: jam eò res devenit, ut omnium artium longe vilissima censeatur.—Hippocr. Lex. At eorum aliquid, quæ nondum inventa sunt, invenire; quodque invenisse, quam non invenisse præstiterit; similiterque imperfecta ad finem deducere: id mihi videtur illius esse munus, qui intelligens existimari expetit.—Hippocr. Lib. de Arte.

*Translation of the above for the English reader.*

Medicine is of all arts the noblest; but on account of the ignorance of them who practise it, and of the ignorance of the public, who judge and esteem them as physicians; things have now come to such a pitch, that of all arts it is thought to be the vilest. But to invent something which has not yet been discovered; and to find out what has not been found out before; and, in like manner, to perfect that which is imperfect: this appears, to me, to be the office of one who desires to be thought intelligent.



Ἄλλα τί λέγει ἡ γραφή; Ἐκβαλε τὴν παιδίσκην καὶ τὸν υἱὸν αὐτῆς·  
οὐ γὰρ μὴ κληρονομήσῃ ὁ υἱὸς τῆς παιδίσκης μετὰ τοῦ υἱοῦ τῆς ἐλευ-  
θέρας. Ἄρα, ἀδελφοί, οὐκ ἐσμὲν παιδίσκης τέκνα, ἀλλὰ τῆς ἐλευ-  
θήρας. ΕΠΙΣΤΟΛΗ ΠΡΟΣ ΓΑΛΑΤΑΣ. Κεφ. έ. Στιχοὶ λ' α'.

DEDICATION.

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TO THE  
VERY REVEREND DOCTOR CHALMERS, D.D.  
PRINCIPAL OF THE UNIVERSITY OF EDINBURGH,

THIS WORK  
Is gratefully Inscribed,  
IN TESTIMONY OF USEFUL INFORMATION RECEIVED,  
WHILE PURSUING HIS ACADEMICAL STUDIES,

BY

THE AUTHOR.





## ADVERTISEMENT.

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DEAR READER,—I suppose your object in reading, study, and experimental investigation, is the attainment of truth. This being the case, it will save you trouble to be informed, at once, that the result of my labours in the succeeding work, is as follows :—

1st, That fevers are of two kinds, simple, and congestive or malignant.

2nd. That the proximate cause of simple fevers is increase of *healthy irritation* in some organs and decrease of it in others.

3rd. That the proximate cause of congestive or malignant fevers, is increase of *morbid irritation* in some organs and decrease of it in others.

4th. That *healthy irritation* is dependent on the *presence of a due quantity of oxygene in the blood.*

5th. That *morbid irritation* depends on *deficiency of oxygene in the blood*.

6th. That the primary impression, (which constitutes the predisposition) in the production of fevers, of whatever kind, is made, *not* on the *solidum vivum*, the nervous system, (as the moderns say,) but on the *fluidum vivum*, the blood (as the ancients and the great John Hunter said, and as the Bible implies).

7th. That the *exciting*, or *occasional* causes of fever, whether physical or moral, operate on the *solidum vivum*, the nervous system; and so far, it appears to me, that the moderns are right; but they seem to have erred in not attaching due importance to the *predisposing causes*, which determine the *nature of fever*.

8th. That the treatment which is necessary for the *cure of malignant fever*, is positively *injurious* in the case of *simple fevers*; and, *vice versâ*, what would be *insufficient* to cure malignant fevers, will be quite *efficacious* in the *treatment of simple ones*.

How far I have succeeded in supporting these propositions, (which I believe to be truths, and to be the legitimate results of my investigations,) you, dear Reader, have a voice in determining.

If, however, the following little volume should prove the means of *increasing* your knowledge,

whether by *presenting new ideas* to your mind, rearranging old, or *suggesting* new ones, however you may be benefited, I shall not regret the time and pains spent in its composition and publication, even if they should entail on myself difficulties, of which every author runs the risk.

With best wishes,

I am,

Dear Reader,

Yours faithfully,

THE AUTHOR.





## PREFACE.

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THIS work was commenced in the year 1840, while the author was residing in the island of Porto Rico. His object in undertaking it, was to account to himself for the phenomena of fever, and to settle his own mind as to its proper mode of treatment; in other words, to reconcile, if possible, the apparently very dissimilar methods adopted by different practitioners in order to achieve the same end; for during his stay at Port au Prince, Porto Rico, and the Havana, he was frequently called upon to meet, in consultation, French, Danish, and Spanish physicians, many of whom called in question the propriety of using calomel and active purgatives, and even of resorting to general blood-letting, in the cure of fevers; and as regards the exhibition of emetics in such disorders, they considered it to be little less than downright murder.

Thus situated, the author was reduced to the alternative either of giving up doctrines which he had received as true, on the credit of those who inculcated them, (those doctrines which he first received while pursuing his academical studies at the University of Edinburgh,) or of putting them to the test (in the spirit of candour and fairness) of a rigid, and (on his part) a painful examination.

In the following work, the author has thought for himself; he has, he thinks, in some instances, made use of original expressions to convey his ideas; and his reasonings are based upon facts which he has had ample opportunities of verifying. These things, he hopes, will not give offence; for they are mere forms, and have nothing to do with the spirit of the work.

When he commenced his labours, however, he had the advantage of but few books of reference; and though he has been residing in this country since the middle of the year 1842, he has not had it in his power either to avail himself of the conversation of learned men, or to consult their writings; a circumstance which, no doubt, is to be regretted, but of which he cannot attribute the fault to himself.

Should he, therefore, appear to be in arrears of the advance of science, he claims the indulgence of the generous and enlightened reader, from whom he



will be happy to receive any suggestions he may be disposed to offer, with a view of rendering a future edition of this little work more useful to the rising generation, as well as more applicable to the actual necessities of the present state of society, particularly in the West Indies, and other tropical climates.

He thinks he cannot do better, here, than transcribe the article on fever out of the last edition of Hooper's "Medical Dictionary," which will form a good preliminary to the author's introductory observations.

"Febris, (from *ferveo*, to burn;) pyrexia, a fever. A disease, of all to which we are subject, perhaps the most difficult to define, although an extremely common one, and one which, when formed, is not likely to be mistaken for any other. Almost every writer on diseases has given a different definition of fevers, so that no one seems to have been satisfied with that of his predecessors. From the names which have been applied to the disease, it is evident that *heat of the body* has been always an essential symptom. Pyrexia in the Greek means heat; febris of the Latins means heat; and when, under any circumstances, a person is hot, we say he burns as if he had a fever. This *symptom*, though present in most cases of fever, is not in all; for *we occasionally have fevers go through their course with-*

out any *increase* of *temperature*. Another symptom which pathologists have dwelt on very much, is an *accelerated pulse*, which, like the former, though *generally* present, is *not* observed in *every* instance; for *some of the worst*, and even *fatal cases*, go *through their course* without the *pulse* being *increased* in *velocity*. In *general*, fevers are ushered in with chilliness: the pulse soon after becomes frequent, and the heat of the body is increased, and with these symptoms several of the functions of the body are impaired, and the strength of the limbs is diminished, with more or less of *mental disturbance*, and *no local* disease.

“An attack of fever is most commonly announced by languor and debility, a sluggishness of motion, and some uneasiness on attempting it. The face and extremities become pallid, the features seem sunk, the bulk diminished, and the skin is contracted. A sensation of cold next is experienced down the back, as if a cold wind or a cold fluid were descending along it; and this feeling gradually extends over the whole body, so that the person feels cold and expresses himself so, while, to the by-standers, he is perhaps morbidly warm. Horripilation frequently attends, and the coldness perhaps, increases to a rigor or shivering. In this early stage the mind is often unsteady, confused, and the person very fidgetty and forgetful. In

some cases stupor sets in, though in a trifling degree. In such cases as have these *chilliy symptoms*, the *pulse* is *decidedly smaller in diameter*, and *weaker in power*, but *constantly increased in number*. The appetite departs on the approach of fever, nausea quickly following; and in many cases there is frequent vomitings, and that which is thrown off the stomach is vitiated gastric mucus or secretion, and often it is bilious. The breathing is agitated, irregular, and perhaps laboured. With these symptoms there are also wandering pains about the joints and limbs, which are tensive and dull, except a fixed one in the small of the back, which is often acute and gives great distress. The secretions universally are diminished; the mouth is dry and parched, causing thirst; the skin shrivelled and dry; the urine scanty; the bowels confined. These symptoms are, sooner or later, changed into flushings of the face, the skin fills out and becomes more natural; the skin now feels universally hot, and the mind perhaps wanders. The pulse is now more frequent, more full, and has more energy. These two sets of symptoms, distinguishable very readily by the patient and the by-standers as hot and cold stages, alternate very quickly, and are attended by more or less *well-marked fears, horrors, chills, rigors*, and *deliriousness*; and, sooner or later, they are succeeded by a perspiration, under which

their force abates, and the symptoms of the cold stage vanish, the urine and other secretions become more free, and a considerable sediment is noticed in the urine after it has stood and become cold.

“The physiognomy at the commencement of fever is often well marked ; so much so, indeed, that the disease is often *known* to be a *fever* by *it alone*, before any *knowledge of the disease* or its other symptoms is acquired. With more or less of the symptoms enumerated, the *fever* becomes *determined* and *fixed*. The period in which it may be said to be forming is uncertain, seldom more than twenty-four hours. Under an *increase* of their *violence*, mostly *towards evening*, the *fever* is said to *exacerbate*, and, this *period of increased violence* is called *the exacerbation* ; it lasts several *hours*, and then the *symptoms* somewhat *abate*, but they *retain a greater degree of FORCE* than *they had before the exacerbation* ; and then, again, *once or twice* in the *twenty-four hours* they *exacerbate*, and so *the fever continues* and *increases in violence*. *Such a fever is called a continued one*. At an *uncertain time*, *many days perhaps*, and mostly so, a *crisis takes place*, when it *shows a disposition to diminish or prove fatal*.

“Such are the *phenomena* of *fevers* in their *acute, regular, and distinct forms*.

“If the *symptoms very much diminish* after *four*,

*six, eight, or twelve hours, and having so diminished in force, return again as violently, or more so than before, it is said to remit, and the fever is called a remittent; the time of the diminished force, or when the fever seems going off, is termed the interval of remission; the other time, the paroxysm.*

“If the symptoms, after having continued several hours, wholly vanish, and having left the patient from six to seventy-two hours, one, two, or three days, should return again, the fever is called an intermittent, and the fevered period is called the paroxysm or fit, and the well period, the intermission.

“Most nosologists, in arranging fevers into genera, have taken the line of demarcation from the character of their duration; as limited in a single paroxysm; as composed of numerous paroxysms with intervals of intermission, or perfect apyrexia; as composed of numerous exacerbations, with intervals of remission, or imperfect apyrexia; and as composed of a single series of increase and decrease, with a mere tendency to intervals of remission, without perfect apyrexia at any time. Other nosologists have drawn their generic distinctions from other circumstances; as their inclination to vigour and violence, or weakness and debility of action; or their disposition or indisposition to



putridity; or their tendency to a sporadic or epidemic character."

Physicians, in every age, have been anxious to discover the immediate or proximate cause of the singular appearances of fever; but as collecting all the theories which have appeared would be attended with no advantage, we shall only give those which have been particularly distinguished. "Upon this subject," says Dr. Good, (from whom this article is principally taken and contracted,) "a great deal of learned dust has been raised, and a great deal of valuable time consumed. Ancient speculations have been overthrown, and modern speculations, in vast abundance, erected upon their ruins; which, in rapid succession, have also had their day, and expired. It is an inquiry, therefore, not likely to prove very productive; yet, as forming a part of medical science, of which no student should be altogether ignorant, it seems necessary to extend it to a brief survey of the most popular doctrines which have been advanced upon the subject in different ages."

Fevers, then, in respect to their proximate cause, have been *conjectured to originate from a morbid change, either in the composition of the blood, or in the tone or power of the living fibre*. The first view has given rise to various hypotheses that rank under the *common division of the humoral patho-*

logy. The second has given rise to other hypotheses appertaining to the *common division* of the *fibrous or nervous pathology*.

The hypothesis derived from the one or the other of these sources that are chiefly entitled to attention are the following, of which the first two belong to the former division, and the remainder to the latter.

I. That of the Greek schools, founded on the doctrine of a concoction and critical evacuation of morbid matter.

II. That of Boerhaave, founded on the doctrine of a peculiar viscosity, or lentor of the blood.

III. That of Stahl, Hoffman, and Cullen, founded on the doctrine of a spasm on the extremities of the *solidum vivum*, or living fibre.

IV. That of Brown and Darwin, founded on the doctrine of accumulated and exhausted excitability or sensorial power.

V. To which we may add that fevers have, by some physiologists, as Dr. Clutterbuck and Professor Marcus, been *identified with inflammation*; and their *proximate cause* been ascribed to *increased action in some particular organ*.

1. It was the opinion of Hippocrates, that fever is an effort of nature to expel something hurtful from the body, either *ingenerated* or *introduced from without*. Beholding a violent commotion in

the system, followed by an evacuation from the skin and kidneys, with which the paroxysm terminated, he ascribed the commotion to a *fermentation*, or *concoction*, or *ebullition*, by which the noxious matter was separated from the sound humours; and the evacuation to a despumation or scum which such separation produced, or rather to the discharge of this morbid scum from the emunctories that open externally. Galen supported this view with all the medical learning of his day; and it is *the only explanation of fever to be met with in medical writings through the long course of three thousand years*; in fact, till the time of Sydenham, who still adhered to it, and whose pages are full of the language to which it naturally gave birth. It blended itself almost insensibly with the language of the chemists of the day. And hence the supposed despumation was contemplated as possessed, according to different circumstances, of different chemical qualities and characters; and particularly as being acid, alkaline, effervescent, or charged with some other acrimonious principle too highly exalted, or in too great a proportion.

This doctrine, considered merely hypothetically, is not only innocent, but highly ingenious and plausible. It is in unison with several of the phenomena of febrile diseases, and derives a strong collateral support from the general history of erup-

tive fevers, in which we actually see a peccant matter, producing general commotion, multiplying itself as a ferment, and at length separated and thrown off at the surface by a direct depuration of the system. *So far, therefore, as relates to eruptive fevers, the opinion is sufficiently correct.* But the moment it is brought forward *as the proximate cause of fever, properly so called, in which there is no specific eruption, it completely fails.*

For, first, no explanation is here given as to the means by which any such concoction, or fermentation, or multiplication of morbid matter, in any way takes place. Next, there are many fevers produced evidently by cold, fear, and other excitements, as well mental as corporeal, in which, most certainly, there is no morbid matter introduced, and wherein we have no reason to conceive there is any generated internally; while the disease, limited perhaps to a single paroxysm, closes, nevertheless, with an evacuation from the skin or the kidneys. And, thirdly, we sometimes behold fevers suddenly cured, as Dr. Cullen has observed, by a hæmorrhage so moderate, as, for example, a few drops of blood from the nose, as to be incapable of carrying out any considerable portion of a matter diffused over the whole mass of the blood; while we are equally incapable of conceiving how such diffused morbid matter could collect itself at a

focal point, or pass off at a single outlet, or of tracing in the discharge, after the minutest examination, any properties different from those of blood in a state of full health.

2. The acute and penetrating mind of Boerhaave, who was born in 1668, (see how the birth of great physicians keeps pace with the progress of religious and civil reformations,) was sufficiently sensible of this danger; and the discoveries which were now taking place in chemistry and physiology led him progressively to the construction of a new theory, which, in a few years, became so popular as to obtain a complete triumph over that of the Greek schools. Leeuwenhoeck, by a delicate and indefatigable application of the microscope to animals of a transparent skin, had endeavoured to establish it as a fact that the constituent principles of the blood consist of globular corpuscles; but that these corpuscles differ in size in a regular descending series, according to the constituent principles themselves; and that each set of principles has its peculiar blood-vessels, possessing a diameter just large enough to admit the globules that belong to it, and consequently incapable, without force, of allowing an entrance of those of a larger magnitude; and hence that the blood-vessels possess a descending series as well as the particles of the blood.

It was upon this supposed fact that Boerhaave built his hypothesis. He conceived that almost all diseases may be resolved into an introduction of any given series of particles of blood into a series of vessels to which they do not properly belong; and he distinguished such introduction by the name of *error loci*. He conceived, still further, that this heterogeneous admixture is very frequently taking place, and that its chief cause consists in a disproportion of one or more sets of the sanguineous principles to the rest, by which their globular form is occasionally broken down and destroyed, and rendered either too thin and serous, or too gross and viscid. This viscosity of the blood he distinguished by the name of *lontor*, and to a prevalence of this *lontor* or viscosity he ascribed the existence of fever, maintaining that the general disturbance which constitutes fever proceeds from an *error loci* of the viscid blood, whose grosser corpuscles, from their undue momentum as well as superabundance, press forcibly into improper series of vessels, and stagnate in the extremities of the capillaries; whence the origin of the cold stage, and consequently of the stages that succeed it, to which the cold stage gives rise.

The system of Boerhaave, therefore, consisted of an elegant and artful combination of both the earlier and later doctrines of corpuscular physiology.



The most triumphant fact of the Boerhaavian hypothesis is, that the crust on the blood, in inflammatory fever, is often found peculiarly dense. But as fevers (and certainly the greater number) are found without any such crust; and as a similar crust, though perhaps not quite so dense, exists under other and very different states of the body, as in pregnancy and scurvy, even this leading appeal has long lost its power of conviction; whilst the abruptness with which fevers make their assault, from sudden occasional causes, and in constitutions of every diversity, forbid the supposition that, in such cases, a lentor or sizy crisis of the blood can have time to be produced, however it may *exist occasionally*, and be perhaps *the source of other disorders*.

3. To this period of time, in the production of fever, and indeed of all other diseases, the human body was regarded as almost entirely passive, a mere organic machine operated upon by some autocrateia, as Nature, or a vis medicatrix, but in the same manner as other machines, and mostly by similar laws. Its muscles were contemplated as mechanical levers, and its vessels as hydraulic tubes, whose powers were calculated upon the common principles of mechanics and hydronamics, and were only supposed to be interfered with by the internal changes perpetually taking place in the

fluids they had to convey. A new era, however, at length began to dawn upon the world; a more comprehensive spirit to pervade medical study; *the animal frame was allowed to exhibit pretensions superior to the inanimate*, and not only to be governed by powers of its own, but by powers which are continually and systematically, from a given point, operating to the preservation of health, where it exists, and to a restoration of health, where it has been lost or injured. Stahl, who was contemporary with Boerhaave, and in the University of Halle in 1694, first started this loftier and more luminous idea,—more luminous, though *the light was still struggling with darkness*, —made *the mind the controlling principle*, and *the solidum vivum*, or *nervous system*, the means by which it acted. Fever, on his hypothesis, consisted in a constrictive or tonic spasm, in his own language, *spasmus tonicus*, produced by a torpor or inertness of the brain, at the extremity of the nerves, and counteracted by the remedial exertions of the mind, the vires medicatrices of his hypothesis, labouring to throw off the assailing power, whence the general struggle and commotion by which the febrile paroxysm is characterised. Hoffman, who was a colleague of Stahl, took advantage of this new view, followed up the crude and primary ideas of Stahl with much patient and laborious investiga-

tion, and soon presented to the world a more correct system, in a more attractive style, but apparently with a disengenuous concealment of the source from which he had borrowed his first hints. He omitted the metaphysical part of the Stahlian hypothesis, took from the mind the conservative and remedial power over the different organs with which Stahl had absurdly endowed it; seated this power as a law of life in the general organisation; separated the nervous from the muscular fibres, the latter of which were regarded as only the extremities of the former by Stahl; allowed a wider range and longer term to the constrictive spasm of fever; and changed its name from *spasmus tonicus* to *spasmus periphericus*; giving, also, to the moving power of the muscular or irritable fibres the name of *vis insita*, as that of the nervous fibre was called *vis nervea*.

It is highly to the credit of Boerhaave, that his mind, in the latter part of his life, was so fully open to the merits of this hypothesis, that he admitted the agency of the nervous power, though a doctrine that struck at the root of his own system.

Dr. Cullen, about the year 1760, boldly ventured upon a new attempt for the purpose of simplifying and facilitating the pathology of fever. As his basis he took the hypothesis of Stahl, as modified and improved by Hoffman; and on this basis erected

his stately and elaborate structure, so well known to the medical world, full of ingenuity and daring genius, and *which, if it be at this moment crumbling into decay, certainly is not falling prostrate before any fabric of more substantial materials, or more elegant architecture.* Cullen has been accused of the same want of ingenuousness towards Hoffman, as Hoffman is charged with towards Stahl; and of having introduced his system to the public with little or no acknowledgment of the sources from which he has drawn them. But surely no one can bring forward such an accusation who has read, with any degree of attention, the preface to his Practice of Physic, in which he gives a full account of Dr. Hoffman's system in his own words, and pays complete homage to his merits.

According to the more elaborate principles of the Cullenian system, the human body is a congeries of organs, regulated by the laws not of inanimate matter, but of life, and superintended by a mobile and conservative power or energy seated in the brain, but distinct from the mind or soul; acting wisely, but necessarily, for the general health; correcting deviations, and supplying defects, not from a knowledge and choice of the means, but by a pre-established relation between the changes produced, and the motions required for the restoration of health; and operating, therefore, through the medium of

the moving fibres, upon whose healthy or unhealthy state depends the health or unhealthiness of the general frame; which fibres he regarded, with Stahl, as simple nerves, the muscular filaments being nothing more than their extremities, and by no means possessed of an independent *vis insita*.

The *brain*, therefore, upon this hypothesis, is the *primum mobile*, but it closely associates in its action with the heart, the stomach, and the extreme vessels.

The force of the heart gives extension to the arteries, and the growth of the body depends upon such extension in conjunction with the nutritious fluid furnished by the brain, and deposited by the nerves in the interstices of their own fibres; the matter of which fibres is a solid of a peculiar kind, whose parts are united by chemical attraction. All nervous power commences in the encephalon; it consists in a motion beginning in the brain, and propagated from thence to the moving fibres, in which a contraction is to be produced. The power by which this motion is propagated, we name, says Dr. Cullen, the energy of the brain; and we, therefore, consider every modification of the motions produced as modifications of that energy. He further lays it down as a law of the œconomy, that the energy of the brain is alternately excited and collapsed, since every fibrous contraction is suc-

ceeded by a relaxation ; whence spasms and convulsions are *motus abnormes*, and consist in an irregularity of such alternation.

But we must distinguish, in this system, between the energy of the brain and the vital fluid it sends forth by the nerves ; for while the former rises and sinks alternately, the latter remains permanently the same. It is not a secretion, but an inherent principle, never exhausted, and that never needs removal.

This hypothesis, in its various ramifications, influenced every part of his theory of medicine, and consequently laid a foundation for his doctrine of fever. The proximate cause of fever was, in his opinion, a collapse or declination of the energy of the brain, produced by the application of certain sedative powers, as contagion, miasm, cold, and fear, which constitute the remote causes. This diminished energy extends its influence over the whole system, and occasions an universal debility, but chiefly over the extreme vessels, on which it induces a spasm ; and in this spasm the cold fit is supposed to consist.

“Such, however,” to adopt the words of Cullen himself, “is the nature of the animal œconomy, that this debility proves an indirect stimulus to the sanguiferous system ; whence by the intervention of the cold stage, and spasms, connected with it, the action of the heart and large arteries is increased,



and continues so till it has had the effect of restoring the energy of the brain, of extending this energy to the extreme vessels, of restoring, therefore, their action, and thereby especially overcoming the spasm affecting them ; upon the removing of which the excretion of sweat, and other marks of the relaxation of the excretories, take place."

This relaxed perspiratory section of the paroxysm, however, is not regarded by Cullen as a part of the disease, but as the prelude to returning health. Yet the fit still consists of three stages : the first of debility or diminished energy ; the second, of spasm ; and the third, of heat. And though Cullen had some doubts whether the remote cause of fever might not produce the spasm as well as the atony of the nervous system, yet he inclined to ascribe the second stage to the operation of the first, as he did most decidedly the third to that of the second ; and thus to regard the whole as a regular series of actions, employed by the *vis medicatrix naturæ* for the recovery of health.

That fever, in its commencement, or earliest stage, is characterized by debility of the living fibre, or, more closely, in the words of Cullen, by diminished energy of the brain, extending directly or indirectly to the voluntary muscles and capillaries, cannot for a moment be doubted by any one who accurately watches its phenomena. And thus

far the Cullenian hypothesis is unquestionably correct ; as it appears to be, also, in supposing the cold stage to be the foundation of the hot, and of the excretion of sweat by which the hot stage is succeeded. But it fails in the two following important points, without noticing a few others of smaller consequence. The spasm on the minute vessels produced by debility takes the lead in the general assault ; and, though it forms only a link in the remedial process, it is the most formidable enemy to be subdued ; and hence all that follows in the paroxysm is an effort of the system to overcome this spasm. The effort at length proves successful ; the debility yields to returning strength ; the spasm is conquered, and the war should seem to be over. But this is not the fact : the war continues notwithstanding ; there is nothing more than a hollow truce ; debility and spasm take the field again, and other battles remain to be fought. *There is nothing* in this hypothesis to account for a *return of debility and spasm*, after they have been subdued ; *nor to show why spasm should ever, in the first instance*, be a result of debility.

The next striking defect is, that debility is here made a cause of strength ; the weakened action of the first stage giving rise to the increased action and re-excited energy that restore the system to a *balance* of health ; and here, again, we *stand in*

*need of the interposition of some present divinity to accomplish such an effect by such means.*

IV. It is not, therefore, to be wondered at, that this system, with all its ingenuity and masterly combination, should not have proved satisfactory to every one. In reality, it did not for many years prove satisfactory to every one in the celebrated school in which it was first propounded. And hence, under the plastic hands of Brown, arose another hypothesis, of which we shall proceed to give a very brief outline, together with the modification it received under the finishing strokes of Darwin.

It had great simplicity of principle, and some plausibility of feature; it attracted the curious by its novelty, the indolent by its facility, and every one by the boldness of its speculations. It circulated widely, and soon acquired popularity abroad, as well as at home.

Man, according to Brown, is an organised machine, endowed with a principle of excitability, or predisposition to excitement, by means of a great variety of stimuli, both external and internal, some of which are perpetually acting upon the machine; and hence the excitement which constitutes the life of the machine is maintained. Excitability, therefore, is the nervous energy of Cullen, and, like that, is constantly varying in its accumulation and

exhaustion; yet not, like the nervous energy of Cullen, under the direction and guidance of a *vis conservatrix et medicatrix naturæ*, distinct from the matter of the organization itself, but passively exposed to the effect of such stimuli as it may chance to meet with, and necessarily yielding to their influence.

Upon this hypothesis, excitement is the vital flame, excitability the portion of fuel allotted to every man at his birth, and which, varying in every individual, is to serve him without any addition for the whole of his existence: while the stimuli by which we are surrounded, are the different kinds of blasts by which the flame is kept up. If the fuel or excitability be made the most of, by a due temperature or mean rate of blasts or stimuli, the flame or excitement may be maintained for sixty or seventy years. But its power of supporting a protracted flame may be weakened by having the blast either too high or too low. If too high, the fuel or excitability will, from the violence of the flame, be destroyed rapidly, and its power of prolonging the flame be weakened directly; and to this state of the machine Brown gave the name of indirect, or exhausted excitability. If the blasts or stimuli be below the mean rate, the fuel, indeed, will be but little expended, but it will become drier and more inflammable, and its power of prolonging the flame

will be still more curtailed than in the former case ; for half the blast that would be required to excite rapid destruction antecedently, will be sufficient to excite the same effect now. This state of the machine, therefore, the author of the hypothesis contradistinguished by the name of direct debility or accumulated excitability.

Upon these principles he founded the character and mode of treatment of all diseases. They consist but of two families, to which he gave the name of sthenic and asthenic : they result from accumulated or exhausted excitability. Inflammatory fever belongs to the first division, and typhus to the second.

The Brunonian hypothesis offers one principle that is unquestionably founded on fact, and is peculiarly worthy of attention ; that of accumulated excitability from an absence or defect of stimuli ; in colloquial language, an increase of energy by rest. And it is this principle which forms the hinge on which turns the more finished system of Darwin.

Sensible of the objection that weighs equally against that part of the system of Cullen and Brown which represents the energy or excitability of the living frame as capable of recruiting itself after collapse or exhaustion, without a recruiting material to feed on, he directly allows the existence of such

a material; regards it as a peculiar secretion, and the brain as the organ that elaborates and pours it forth. The brain, therefore, in the system of Darwin, is the common fountain from which every other organ is supplied with sensorial food, and is itself supplied from the blood, as the blood is from the food of the stomach.

All this is intelligible, but when beyond this, he endows this sensorial fluid with a mental as well as a corporeal faculty, makes it the vehicle of ideas as well as of sensation, and tells us that ideas are the actual "contractions, or motions, or configurations of the fibres which constitute the immediate organ of sense;" he wanders very unnecessarily from his subject, and clogs it with all the errors of materialism.

He supposes the sensorial power, thus secreted, to be capable of exhaustion in four different ways, or through four different faculties of which it is possessed: the faculty of irritability, exhausted by external stimuli, affecting simple irritable fibres; that of sensibility, exhausted by stimuli affecting the fibres of the organs of sense, that of voluntariness; exhausted by stimuli affecting the fibres of the voluntary organs acting in obedience to the command of the will; and that of associability, exhausted by stimuli, affecting organs associated in their actions by sympathy or long habit. By all or any of these



means, the sensorial power becomes evacuated, as by food and rest it becomes replenished, often, indeed, with an accumulation or surplus stock of power.

In applying this doctrine to fever, he considers its occasional causes, whatever they may be, as inducing a quiescence or torpor of the extreme arteries, and the subsequent heat as an inordinate exertion of the sensorial power hereby accumulated to excess; and, consequently, the fever of Darwin commences a stage lower than that of Cullen, or in the cold fit, instead of in a collapse of the nervous energy lodged in the brain.

Now, allowing this explanation to account for the cold and hot stages of single paroxysms of fever, like the spasm of Cullen, it will apply no further. For when the sensorium has exhausted itself of its accumulated irritability, the disease should cease. It may, perhaps, be said, that a second torpor will be produced by this very exhaustion, and a second paroxysm must necessarily ensue. Admitting this, however, for a moment, it must be obvious that the first or torpid stage only can ensue; for the system being now quite exhausted, the quiescence that takes place during the torpor can only be supposed to recruit the common supply necessary for health: we have no reason to conceive, nor is any held out to us, that this quantity can again rise to a surplus. Yet it must be

farther remarked, that in continued fevers we have often no return of torpor or quietude whatever, and, consequently, no means of reaccumulating irritability; but one continued train of preternatural action and exhaustion, till the system is completely worn out. And to this objection the Darwinian hypothesis seems to be altogether without a reply.

V. There are other pathologists who have referred the proximate cause of fevers to a morbid affection of some particular organ, or set of organs associated in a common function. Thus, Baron Haller alludes to several in his day, who ascribed it to a diseased state of the vena cava. Bianchi pitched upon the liver; Levalve on the pancreas; Rhau on the digestive organs generally; Dr. Clutterbuck has still more lately, in our own country, and with far more reason and learning, brought forward the brain, to an inflammation of which organ he ascribes fevers of every kind, regarding them merely as so many varieties of one specific disease, originating from this one common cause. But this is to confound fever with local inflammation, the idiopathic with the symptomatic affection. A very striking objection to Dr. Clutterbuck's hypothesis, is his limiting himself to a single organ as the cause of an effect which is equally common to all of them. And on this ground it is that Professor Marcus of Bavaria, who has contended with similar strenuous-

ness for the identity of fever and inflammation, has regarded all inflamed organs as equal causes ; and is hereby enabled to account, which Dr. Clutterbuck's more restricted view does not so well allow of, for the different kinds of fever that are perpetually springing before us, one organ giving rise to one, and another to another. Thus, inflammation of the brain, according to Dr. Marcus, is the proximate cause of typhus ; inflammation of the lungs, of hectic fever ; that of the peritonæum, of puerperal fever ; and that of the mucous membrane of the trachea, of catarrhal fever.

The general answer, however, to pathologists of every description who thus confound or identify fever with inflammation, whether of a single organ or of all organs equally, is, that though fever is commonly a symptom or sequel of inflammation, inflammation is not uncommonly a symptom or sequel of fevers. And hence, though post-obit examinations, in the case of those who have died of fever, should show inflammation in the brain, the liver, or any other organ, it is by no means a proof that the disease originated there, since the same appearance may take place equally as an effect, and as a cause ; whilst a single example of fever terminating fatally, without a trace of inflammation in any organ whatever, (and such examples are perpetually occurring,) is sufficient to establish the existence of

fever as an idiopathic malady, and to separate the febrile from the phlogotic divisions of diseases.

“A fever, therefore,” to adopt the language of Dr. Fordyce, “is a disease that affects the whole system ; it affects the head, the trunk of the body, and the extremities ; it affects the circulation, the absorption, and the nervous system ; it affects the skin, the muscular fibres, and the membranes ; it affects the body, and affects likewise the mind. It is, therefore, a disease of the whole system in every kind of sense. It does not, however, affect the various parts of the system uniformly and equally ; but, on the contrary, sometimes one part is much affected in proportion to the affection of another part.”

The result of the whole is, *that we know little* or nothing of the proximate cause of fever, or the means by which its phenomena are immediately produced. In the language of Lieutaud, applied to the subject before us, they are too often *atrâ coligine mersæ* ; nor have any of the systems hitherto invented to explain this recondite inquiry, however ingenious or elaborate, answered the purpose for which they were contrived.

Dr. Cullen resolves all remote causes into debilitating and sedative powers, instead of being stimulant, as they were formerly very generally considered, and as they are still regarded, by many pathologists, and especially by those who contemplate fever and inflammation as identic.

Respecting the other, or remote causes of fever, they are either marsh or human effluvia, exposure to cold, fear, intemperance, and other circumstances, which are particularly noticed in the account of each genus of fever.

Of the division of fevers.—Fever is distinguished into intermittent, remittent, continued, and hectic. See ague, inflammatory fever, remittent fever, mixed fever, typhus fever, puerperal fever, and nervous fever; also synocha, synochus, and typhus.

Let me now conclude this lengthy, but not useless, quotation with the following observations:—As, in the investigation of this intricate and interesting subject, (being fully aware of my own natural incapacity to unravel a mystery that had confounded the most capacious and penetrating intellects of the most celebrated professors of the science of medicine,) I was led to seek the illumination of the Spirit of Truth, and, at the same time, diligently to use every means within the sphere of my ability, to obtain the object of my desire; I am convinced, therefore, that my seeking and my labour have not been in vain. At all events, I feel myself wiser than when I began my investigation; and I am disposed to think, that what has been useful to me, in the character of a sincere inquirer after truth, cannot be valueless to another person similarly situated.

I therefore commit my work, and all its imperfections, (which may naturally be expected, from the unfavourable circumstances under which the author wrote,) with confidence, to the disposal of an all-wise Providence, being fully assured, that the intention of the work will be achieved, if not immediately, at least in the Lord's appointed time.

In the meantime, I appeal to the University of Edinburgh, and to all learned and candid men, whether individually or collectively, to pronounce their judgment on the merits or demerits of my work; for I trust I shall be just as well pleased to hear of its demerits as of its merits.

11, *Queen's Road, Norland Square,*  
*Notting Hill, July 21, 1846.*





# FEVER

PHYSIOLOGICALLY CONSIDERED.



# FEVER

## PHYSIOLOGICALLY CONSIDERED.

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### INTRODUCTORY REMARKS.

It would be difficult to select, from the whole range of medical science, a subject which has given rise to more theories and different opinions, than fever.

While some have maintained, with Stahl, that the phenomena, shivering, accelerated pulse, increased heat, &c., are the result of the efforts of the vital principle to eliminate, from the body, some offending matter; others, with Boerhaave, have thought, that these same phenomena (according to its different periods and degrees) constitute fever.

Cullen's doctrine of the spasm of the extreme vessels, and the operation of the *vis medicatrix naturæ*, was but a modification of that of Stahl.

Pinel considered fevers to depend on the affection of certain organs, or of their secretions; and, therefore, he divided them into angiothenic, or inflammatory; meningo-gastric, or bilious; adeno-meningic, or mucous. When these were supposed to depend on a malignant cause, or were about to terminate fatally, they then took the names of adynamic, or putrid; ataxic, or malignant; adeno-nervous, or pestilential.

Broussais, also, has considered fevers as the result of certain organic affections, exaggerating certain sympathetic actions, inherent in the system; and thus giving rise to the phenomena usually denominated fever.

It would, indeed, be an endless task, to take notice of all the different opinions which have been advanced from the time of Stahl to the present day, respecting the nature and causes of fever; nor is such my intention, even supposing that I were prepared to enter into such an investigation; for I do not see what good end it would serve.

I merely wish to notice here some of the more notorious doctrines; and such as differ most among themselves, in order to show, in what respects they differ, and in what they agree. And, in the first place, they all differ, in some degree or other, as to the nature of the proximate cause; in other words, as to what is the nature of the internal or

hidden cause of the external or sensible phenomena. But secondly and finally, they all agree as to what are objects of sense, viz. the external phenomena of fever, shivering, accelerated pulse, and increased heat. Now the reason of this appears to be, that these phenomena are of such a nature as to admit of no dispute, being capable of demonstration. On the other hand, the case is quite different when it is a question of the causes of these phenomena,—they not being so immediately the objects of our senses ; and forming a chain of causes, not at all times easy of investigation, from beginning to end ; so that the inquirer sometimes fixes his attention on one link of the chain, and at another time on another link.

Thus, Stahl, considering the effects of something offensive supposed to be taken into the system, by the mouth, by the cutaneous absorbents, or by the lungs, made fever to consist in the efforts of the vital principle to expel this.

Boerhaave, considering the phenomena of shivering, accelerated pulse, increased heat, &c., made it to consist in these.

The same explanation applies to Cullen's doctrine as to that of Stahl, adopting the words *vis medicatrix naturæ* in place of vital principle, and spasm of the extreme vessels for offending cause, different



expressions used by those authors to imply the same ideas.

Pinel, considering the organs principally affected, or such as he supposed to be so, made fevers to consist essentially in these affections; and, therefore, he classified them accordingly.

Broussais differs from Pinel only as his reasonings and investigations tend to different conclusions. Now it will appear on close examination, that the different doctrines which have existed on this subject, are more or less the result of the different objects of investigation. Whence Stahl and Cullen, considering the exciting cause of fever, made it to consist in a struggle of the system to remove this.

Broussais and Pinel, on the other hand, observing the organic changes, or functional derangements, which take place during fevers, determined them to consist essentially in these; whilst Boerhaave, imposed upon by the external phenomena, considered them to constitute fever.

In this manner each one is right according to the view taken; and all agree on what cannot but be seen. So different travellers give different accounts of foreign countries, though each one may be right in as far as he has observed; yet none can be said fully and perfectly to have described any one country; since other persons, when they travel, may

always find something which has not yet been noticed, or something which does not appear as it has been represented. And this arises from no other cause than the nature of the undertaking, to which no one individual is equal.

Having premised these observations, I now purpose taking advantage, in as far as I know, of all that has been previously written or said on fever, and all that my own personal observation suggests, to offer a few remarks on the subject. And I sincerely hope that the difficulty of the subject will be a sufficient excuse for any inadequacy that may appear on my part. The difficulty of the undertaking, however, does not discourage me; since it is the duty of every man, according to his ability, to advance the state of science generally; and of me, particularly, to endeavour to improve that of the profession, of which I am a member, notwithstanding my success may fall infinitely short of my wishes.

From what I have stated, a good reasoner will infer that the study of fever embraces the investigation of a long train of events standing to each other in the relation of cause and effect. And the more complicated the fever, the greater are the number and variety of events, so related, to be taken into consideration. Whence it is plain, that he who only considers a proportion of these events, leaving

out others, must form but an inadequate idea of the nature of the subject. In the same manner, that he who undertakes to describe the physical structure of man, would have but an imperfect notion of it himself; and would convey an insufficient one to others, if he confined himself to a description of the external form, leaving out of the account that of the brain, heart, lungs, and other internal organs.

For the greater facility of treating this subject, therefore, I purpose considering it in relation to exciting, predisposing, and proximate causes; symptoms, diagnosis, and prognosis; results and treatment.

## CHAPTER I.

## OF EXCITING CAUSES.

THE exciting causes of fever may be divided into mechanical and moral stimulants or irritants.

Among the former are to be numbered the operation of cold and moisture; vegetable and animal effluvia in a high state of concentration; insolation; a prevailing elevation of atmospheric temperature; the abuse of various kinds of stimulating aliment, ardent spirits, and fermented liquors; excessive venery; violent and long-continued exercise; and various other agents of a similar nature.

The latter includes excessive study, great mental emotions, such as rage, immoderate love, excessive grief, anxiety, &c.

Now all or any of these causes produce fever, by acting excessively on the irritability of some of the

organs, and thus deranging the harmony of action which prevails among them in the state of health. In order to prove this proposition, let us take any one of them, and show in what manner it operates in order to develop fever. But the operation of anything on the living body necessarily implies the reaction of the organs composing it ; and probably a modification of the sympathetic actions, which are so well proved to exist in the state of health. For instance, the operation of vegetable and animal effluvia may be considered to be that of highly stimulating gas ; which, being inhaled into the lungs, or swallowed in a state of admixture with the saliva, or ingesta, excites the irritability of the mucous surfaces, to which it is applied ; in other words, it produces irritation of the mucous membranes of the bronchi and lungs, the stomach and intestines. This is the first effect produced. However, as yet we have no fever, but there may be a slight catarrh ; exaggerated appetite ; loss of appetite ; constipation ; sometimes looseness ; slight sickness at stomach ; disagreeable taste in the mouth ; slight headache ; weariness of limbs and back ; great disposition to drowsiness ; sleeplessness ; or, in the event of sleeping, a feeling of weariness on awaking, and disagreeable dreams.

To a superficial observer, the subject of such derangement as I have described, appears to ail

nothing. But to a practised eye, there is an expression of uneasiness manifest in the countenance; perhaps the conjunctiva is a little suffused; the countenance very pale or flushed; the tongue coated and whitish, or, it may be, nearly natural. The pulse is generally more languid or quicker than natural; yet the patient is said not to be ill, although he does not "feel altogether well, and hopes that by to-morrow he will be better;" attributing these effects to something eaten, which has disagreed with him, or to an extra glass of wine, &c., which indeed may not have been without some effect.

Here we observe, that the primary effect of the operation of effluvia is that of an irritating gas on the mucous membranes of the lungs, stomach, &c.; and that the immediately subsequent effects of it, though not amounting to fever, closely simulate it, and are to be accounted for in no other way than by taking into consideration the sympathetic actions of the brain, spinal marrow, circulating organs, with the lungs, stomach, and bowels. Whence, when one acts duly, in the state of health, the others act so also; and when one acts unduly, the others act so too, giving rise to a morbid condition of the system, closely resembling fever. And fever has so much to do with all diseases, that it can hardly, in one form or other, be separated from any.

It may not be improper in this place to endea-



vour to assign a just value to each of the symptoms just noticed, as resulting immediately and sympathetically from the introduction of effluvia into the system, and to point out its *modus operandi*.

A slight catarrh, for instance, is the result of a moderate degree of irritation produced by the effluvia, applied to the respiratory organs. A dry cough and a dryness of the same organs result from an excessive degree of irritation, produced by a more concentrated state of the effluvia applied to them. Increased action, in the first instance, is the result of moderate stimulation; and impaired action in the latter results from excessive or long-continued stimulation.

Exaggerated appetite and loss of appetite are the results of a moderate degree of stimulation in the first instance; and, in the second, of excessive or long-continued irritation—both resulting from the difference of the quantity or the quality of the effluvia, applied to the coats of the stomach.

Constipation and looseness.—Constipation is the result of much irritation, producing impaired action. Looseness depends on a less degree of irritation, producing increased action. They both result from the strength of the offending cause, or the length of time it is in operation.

Sickness of stomach and disagreeable taste in the mouth.—Of these the former depends on the appli-

cation of very concentrated effluvia to the coats of the stomach, or of effluvia of ordinary strength, the stomach being predisposed to irritation; in both cases inverted action or sickness is the result. The latter, or disagreeable taste in the mouth, is to be accounted for by the quality of the secretion from the morbidly irritated mucous membrane of the mouth, combined perhaps with the irritating effluvia, making together a disagreeable impression on the nerves of taste.

Slight headache and weariness or uneasiness of the limbs and back, are all the result of the sympathy which exists between the brain, spinal marrow, and spinal nerves, with the stomach and bowels. Whence the one set of organs being irritated, the other becomes so too. And this physiological fact is so well known and admitted, that it would be impertinent to insist upon it here.

Drowsiness depends on the same state as constipation, i.e. torpor and congestion, sympathetically induced in the pia mater, or mucous membrane of the brain.

Sleeplessness proceeds from a similar condition of the same organ, to that which takes place during looseness, in the intestines. Notwithstanding, this symptom may prevail during constipation; and in this case, the mucous membranes of the brain and

nervous system appear to take on the vicarious action of the torpid mucous membrane of the stomach and bowels ; in other words, they are affected in a contrary manner. And it may be well to notice here, that organs which sympathize in the state of health, and in certain stages of disease, take on the vicarious action of the organ or organs with which they are associated, when these become torpid, or, what is the same thing, when the one set becomes entirely inactive the other acts immoderately.

Weariness or uneasiness on awaking from sleep, and dreaming, depend on the same cause, viz. general excitement of the nervous system, in consequence of which sound sleep is impracticable, and therefore the impaired irritability of the muscular system remains unrepaired.

The uneasy expression of the countenance is the result of a sense of uneasiness, or of "morbid organic sensibility," the result of the morbid irritation (not amounting to pain), which the mucous membrane of the brain suffers, in common with that of the mucous membranes generally.

The deranged circulation is the result of the morbid sympathetic action of the heart and arteries with that of the brain, and abdominal viscera, depending on irritation of their mucous surfaces.

The changes in the appearance of the tongue are

to be attributed to the effects of irritation of its mucous membrane, and the morbidly altered mucous secretion.

The suffused conjunctiva depends on its morbid sympathy with the other excited mucous membranes, and on the direct influence of the irritating miasm on it.

The changes in the colour of the countenance depend on collapse and reaction succeeding to each other in the capillaries of the skin and mucous membranes.

Thus have we endeavoured to account for the manner in which effluvia acts on the system, in order to produce the premonitory symptoms of fever. And I think we have clearly shown, that they are referrible to its immediate and sympathetic effects on the mucous membranes of the assimilating and respiratory apparatus.

But in treating of the effects of vegetable and animal effluvia, I have only considered them in the light of chemical stimulants, not referring at all to any specific changes which they may produce in the constitution of the blood, as this is not the place for such a discussion.

Now, although by far the greater number of fevers are called into action by this exciting cause, since it is more generally in operation than any other, particularly at certain seasons of the year, and in

certain situations on the globe; yet, I think the opinion that it is the only one, will find but few supporters.

Let us, in the next place, consider in what manner insolation, or exposure to the meridian rays of the sun, operates in exciting fever. And here again, the action of this cause on the human body presupposes the reaction of its organs, and a modification of their naturally associated actions. Thus, a man in the enjoyment of good health and strength, may, in the discharge of his duties as an out-door clerk to a mercantile establishment in the West Indies, be required to stand on the sea-beach to verify a cargo of lumber, or any other description of merchandise, as it is landed from the vessel discharging,—such a man, I say, may be, nay, often is, exposed to the rays of a tropical sun, from eight o'clock in the morning till noon, his mind meanwhile intent on his occupation, and often irritated by the insults and annoyance of black labourers. While he is so engaged, he is not acutely alive to his bodily sufferings, being only sensible, perhaps, of a disagreeable sensation of heat and thirst. His occupation ended, however, and having returned to his abode, he begins to experience headache, sickness of stomach, weakness of limbs, and pain or uneasiness in the back and loins, more or less thirst, loss of appetite, anorexia. His countenance may

be exceedingly pale or flushed ; his eyes suffused ; tongue white, moist, or dry, and varying, it may be, in volume ; skin dry, or it may be the reverse ; with cold extremities, and sensation of cold in the back and loins ; pulse low, suppressed, and feeble, or it may be high, full, and strong.

These symptoms are decidedly more febrile than such as were enumerated as resulting from the absorption of a certain quantity or quality of effluvia ; and although I have supposed the subject to have been healthy previous to exposure to the sun's burning rays in this case ; yet it often happens, that he is predisposed to fever, by the absorption of miasm, (in a degree not indeed sufficient to awaken that train of morbid sympathetic actions called fevers, but enough to predispose to it :) and then the fever developed by insolation, particularly if the subject be robust and unacclimated, (lately arrived from a cold or temperate climate,) is one of the greatest intensity, attended by symptoms, which some authors attribute to the yellow fever, others to the *causus* or tropical synocha, occurring in a new comer.

Let us now consider how this cause operates, in reference to our subject. The influence of the solar rays irritates the skin generally, and strongly excites, by the attendant glare, the visual organs. The first effects of it, then, are a sensation of heat



and general uneasiness, and a fulness in the head. The mucous membranes of the stomach and bowels now sympathize with the skin, inducing thirst. If drink is supplied, or the subject full of humours, profuse perspiration results. The brain sympathizes with the irritated stomach, and feeling the influence of the direct stimulation of the solar rays on the retina, headache is produced, a usual result of excessive action of its sero-fibrous membrane. The spinal marrow, also, sympathizes with the brain and mucous surfaces of the stomach and bowels. Thus we have fever produced by a different cause operating primarily on a different set of organs. This is what takes place in a healthy subject; but if we suppose the person predisposed to fever, as I have already shown, (by the absorption of miasm, or by any other cause,) we shall find no difficulty whatever in believing, that insolation may develop, in many cases, the Yellow Fever.

A prevailing elevation of atmospheric temperature, by the constant irritation which it keeps up in the system generally, predisposes to febrile action; so that an abuse of stimulating aliment or exciting drinks, in such a state, may develop fever without the aid of any other cause.

So, also, violent exercise, by increasing the momentum of the blood in the heart and arteries, and, in this manner, irritating their mucous surfaces,

which irritation being sympathetically propagated to the mucous surfaces of other organs, may originate fever, much in the same way as the other exciting causes.

Excessive venery acts in a similar way, in the development of fever, as violent exercise; but in this case, the stimulation, which a particular set of organs experiences, the generative, particularly their mucous surfaces, and the violent mental emotions which usually accompany the abuse of sexual intercourse, may not be without a specific influence in a state of the system predisposed to febrile action; so as to give rise to a fever of a very peculiar character, and not unfrequently fatal in its result. The second class of exciting causes mentioned, includes excessive study and strong mental emotions. And all these operate by first exciting the organs of the sensorium commune or the nervous system; which excitement or irritation, being established, soon sympathetically disorders the natural functions of the digestive and circulating systems.

In this mode, can all the phenomena of fever be satisfactorily accounted for; and the more satisfactory will the account be, the greater be our knowledge of physiology.

## CHAPTER II.

## OF PREDISPOSING CAUSES.

HAVING considered fever with respect to exciting, I shall now contemplate it with regard to predisposing causes. To this head may be referred whatever keeps up a preternatural excitement in the system generally, or in any of its organs: as, for instance, a plethoric state of the body; the habitual use of stimulating drinks, such as ardent spirits, fermented liquors, &c.; the absorption of certain quantity of animal and vegetable effluvia, particularly of the latter, generated in great abundance during spring and autumn; continued and excessive mental and bodily exertion; loss of rest; mental anxiety; continued and excessive grief; habitual intemperance; chronic diseases, particularly of the alimentary and respiratory organs. Hence

it appears, that many of those agents noticed as exciting, may, in a less degree, act as predisposing causes; and *vice versâ*. Having noticed their *modus operandi*, in the former chapter, it will be unnecessary to dilate here on the subject.

The only difference between an exciting and a predisposing cause, appears to be in degree: the one only developing a state of the system, which is signified by the word predisposition; the other, that which we term disease, as fever, apoplexy, &c. Consequently, their action on the system must be the same in kind, only differing in degree.

Chronic disease of the alimentary canal and respiratory organs may be regarded in the light of an habitual state of morbid irritation of these organs, not sufficiently great, indeed, to develop a well-marked train of those morbid sympathetic actions, which is termed fever, but subjecting them to greater irritation from any given stimulant, than in the healthy state; and thus, predisposing them, on the application of a further stimulant, to take on that morbid action, which will develop fever.

Thus, a man affected with that disease, which is styled Dyspepsia, of which the symptoms are very various, but may, generally, be referred to chronic irritation of certain portions of the digestive apparatus, whether the stomach, the small intestines, the liver, or other chylopoietic organs—I say, a man

affected with Dyspepsia, after being exposed for a short time to the influence of miasm, generated by sudden changes in the weather, will, without any further cause, contract a fever, which will be fatal in its consequences; while others, and by far the greater number of his fellow-citizens, will as yet feel no inconvenience from the same cause.

In like manner, patients affected with chronic bowel complaints, (i. e. fluxes,) coughs, and those who have been affected with chronic pleurisies, are known to fall easy victims to the first outbreaks of epidemics. So, also, the causes producing epidemic fevers, before they arrive at the degree of vigour necessary for exciting these, give rise to catarrhs, diarrhœas, and other affections of a similar nature. But it is not till the season is further advanced, when they have acquired their due energy, that they can generate the fevers in question. To the joint influence, therefore, of chronic diseases, and other predisposing causes, and to the operation of the lesser degree of those causes, producing in their vigour epidemic diseases, are to be referred, the greater number of sporadic cases of fever, which are noticed in practice.

Besides the predisposing causes noticed above, may be further enumerated, all those occupations or callings, which expose the followers of them to violent exercise, night watching, sudden vicissi-

tudes of atmospheric temperature, the night air, excessive heat, arising from fires or forges, the continued use of salted provisions, or vegetable food in a state of incipient decomposition, impure corrupted air, bad water, &c.

And it is evident that all these act by exciting and sustaining morbid irritation in the system, and in this manner, deranging the harmonious natural actions of the various organs which compose it.

But, as has already been said, what is at one time an exciting cause, will be at another a predisposing. Thus an intemperate liver will be predisposed to fever, in consequence of habitual intemperance; and upon imbibing miasm, will immediately contract it. Here, intemperance is the predisposing, and effluvia the exciting cause.

Again, an habitually temperate man will be, for a long time, exposed to the influence of effluvia, without contracting disease; but after indulging in an extra glass of wine, or a full meal, he will be immediately attacked with severe fever. In this case, intemperance is the exciting, and the absorption of miasm the predisposing, cause.

I might notice many similar instances, but I think the proposition does not require further proof. "*Addemus tamen, quod scire magis expedit, quodque monent peritissimi artis magistri, nimirum varios morbos unâ eâdemque causâ foveri, et vice versâ eundem morbum variis posse generari causis.*"



## CHAPTER III.

## OF PROXIMATE CAUSES.

UNDER this denomination are to be included all those morbid conditions of the various organs, which immediately precede and co-exist with the phenomena commonly called fever; and they are not the less necessary to it than these very phenomena, inasmuch as the latter could not exist without the former, the one being the cause of the other.

And here I may observe, that the phenomena just alluded to, are those states or conditions of the external organs, which are the objects of our senses, the term being derived from the Greek word *φαινομαι*, (I show myself, or I am seen,) means, things seen or manifesting themselves; or what is the same thing, appearances.

But these phenomena depending often on states or conditions of the internal organs, and being themselves states, or affections or conditions of the external organs, cannot be left out of the account, when considering the proximate cause or causes of fever, without detriment to the subject.

I maintain, therefore, that the proximate cause or causes of fever, are those states or conditions or affections of the various organs which exist or prevail, during this disease; which, indeed, constitute it, and which, being removed, the fever ceases.

Hence it is clear, that fever is not an effort of the vital principle to expel some peccant matter from the system; nor does it consist, essentially, in shivering, increased heat, accelerated pulse, &c.; neither is it an effort of the *vis medicatrix naturæ*, to overcome the spasm of the extreme vessels. Nor can an overflow of bile, a redundancy of mucus, be said to constitute this disease, any more than a cutaneous eruption, violent purging or vomiting, pain in the head, &c. And it does not consist in a nervous irritation, a gastro-enteritis, or an inflammatory affection of the blood-vessels.

I say, it essentially consists in none of these conditions. In what, then, does it consist, or what is its nature? It is much easier to answer this question in the negative, than in the affirmative, (i. e.) to show what it is not, than what it is. Whence

something that is exclusively essential to the nature of fevers, or, in other words, that can be predicated of the whole class of them, existing in each individual, is more a desideratum than an invention.

Thus, increased heat of skin is absent in many fevers, and stages of the same fever; so are, accelerated pulse and shivering, the very reverse of these states prevailing; such as coldness of the skin and extremities, slow contracted pulse, with sensation of burning heat. Sometimes, pallor and redness of countenance and skin, alternately prevail; constipation and looseness; overflow, and suppression of the different secretions; pain and insensibility; increased action and torpor; coma and restlessness; delirium and full possession of the intellectual faculties to the latest moment of natural existence; vomiting and the reverse; suppression of urine and the reverse; suppression of cutaneous perspiration and the reverse; thirst and the contrary; anorexia and increased appetite.

Hepatitis sometimes co-exists with fever; at other times splenitis; gastro-enteritis; pulmonitis; renitis; cystitis; urethritis; carditis; arteriatitis; phlebitis; meningitis; cerebritis; peritonitis; phlegmasia glandularum systematis. None of these affections, however, essentially constitute fever; neither is the irritation of any particular organ, or

set of organs essentially necessary to the existence of this disease, so that it cannot exist without it.

But fever must consist in something ; and also, must depend on something. True ; but what is the essential nature of that something ?

Fever, then, appears to consist in disordered action ; for this can be predicated of the whole class of fevers, and of every individual species included under it ; but the same may be said of all diseases. This is also true ; and it is a circumstance which obtrudes itself forcibly on my attention, and which I have already noticed in a former part of this treatise, that fever has so much to do in one form or other, with all diseases, that it can hardly be separated from any.

Yet it may be objected, that this observation only applies to sympathetic fevers, and cannot be referred to essential or idiopathic fever.

This is exactly what I should like to be convinced of. I know, indeed, that there exist sympathetic fevers ; but I cannot determine the character of an essential or idiopathic fever, inasmuch as I could never find one, which was not referrible to the affection of some organ or organs, on the derangement of which, its symptoms did not depend, and could not satisfactorily be accounted for, by one versed in physiology.

Fever, therefore, in common with all other

diseases, appears to consist essentially in disordered action. Must we then conclude, that fever and disease are synonymous terms, meaning the same thing? Not exactly so. But it depends in one form or other on so many different diseases, both functional and organic, and is so intimately associated with them, that we cannot separate them, so that when one ceases, the other vanishes also.

Are we then to be reduced to the necessity of considering this opprobrium medicorum, about which so much has been written, and regarding the nature of which, so many discordant opinions have been advanced, as only a symptom of some other disorder or disorders?

I much fear, that following the dictates of sound reason, and the results of careful observation, there is no choice left to us. For the phenomena or symptoms denominated febrile, are referrible to the abnormal condition of those organs which are immediately the objects of our senses; and this, in turn, most commonly results from the abnormal state, or unnatural action of other organs, which, being situated in the great cavities of the body, are more remote from the investigation of our senses.

Admitting this to be the case, which I think no practical man of extensive observation will attempt to deny; we must next inquire, what those affec-

tions are, with which fever may be said to coincide, and on which it commonly depends?

This brings me to the more particular consideration of proximate causes, or those conditions of our material organs, which give rise to, or awaken that train of morbid sympathetic actions, commonly denominated fever.

And these conditions, as may be readily conceived, are very various, considering the variety of our organs, and the different manner in which each may be affected, to say nothing of the conjoint and sympathetic affections to which they are exposed.

Whence, it is evident, that the nature and character of fever must vary, in regard to the organ or organs primarily affected; the manner and degree of their affection; and the sympathetic actions which result from such affections; since it is difficult, if not impossible, to separate the proximate cause from the fever itself.

I therefore purpose, while considering the subject of the former, to add a few observations on the different kinds of fever, usually noticed by authors, and observed in practice.

The subject will consequently resolve itself into seven different articles, viz.: cerebral or nervous; gastric or abdominal; pulmonary or catarrhal; inflammatory or vascular; rheumatic; glandular or muco-glandular; and erysipelatous fevers.



Having considered each of these articles, which refer to the nature of fever, I shall afterwards discuss the subjects of continued, remittent, intermittent and hectic, which relate to the intensity of fever; and may, with great propriety, be considered to be conditions of fevers, of whatever nature.

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ARTICLE I.—*Cerebral or Nervous Fever.*

This fever may be divided into two kinds, viz., nervous fever with reaction; and nervous fever with collapse. They both depend on affections of the brain and spinal marrow.

In the first, the fibro-serous membranes of those organs are strongly irritated. In the latter, their mucous membranes are the seat of irritation. The state of irritation of the fibro-serous membrane of the brain and its appendages, is attended with symptoms of general reaction, giving rise to a fever, which though characterized by what are styled nervous symptoms, such as delirium, peculiarly quick pulse, irregular contraction of the muscular system, increased sensibility, sensual illusions, is yet attended with the usual phenomena of fever in general, viz. :

accelerated pulse, increased heat of skin, altered appearance of tongue, disordered bowels, &c.

The peculiar nature of this fever, therefore, depends on the state of the fibro-serous membrane of the brain and spinal marrow.

When irritation is seated in the mucous membranes of the brain and its appendages, and is tending to disorganization of its structure, the sympathetic actions are of a very different kind, manifesting themselves in derangements of the stomach and bowels, giving rise to involuntary evacuations from them ; in irregular muscular actions, as subsultus tendinum, singultus, strabismus, convulsions, involuntary discharge of urine, &c. ; in deficient vascular action, as cold extremities, contracted pulse, cold skin ; in retrograde vascular action, as cold sweats, sunken countenance, abolition of intellect and sensation. These symptoms depending on actions and sympathetic actions of a different nature from those which constitute reaction, are signified by the term collapse ; and they are those of what is called, Low Nervous Fever, or Typhus mitior.

Hence it appears, that irritation of the membranes of the nervous system, and its results, and the train of sympathetic irritations, and the results to which they give rise, constitute nervous fever, according to the period and degree of it.

When the membranes of the brain are more particularly the seat of irritation, and its consequences, the fever is signified by the term cerebral—the functions of this organ being, under these circumstances, especially disordered, and attracting, in an especial manner, the attention of the observer.

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## ARTICLE II.—*Of Gastric or Abdominal Fever.*

Under this article I shall notice three varieties of fever, the bilious, the mucous, the adynamic.

The bilious fever depends on especial irritation, and its results, of the mucous membrane of the biliary organs; and it is characterized by changes in the secretion of the bile; although the remaining abdominal viscera, in a greater or less degree, participate in a similar affection, such as the mucous membranes of the stomach and bowels, the kidneys, the bladder, &c.—the mucous membranes of the other organs of the system, meanwhile, sympathizing with these, and in this manner originating the general symptoms.

The mucous fever depends on especial irritation, and its results, of the mucous membrane of the ab-

dominal organs, principally of the stomach and intestines; and it is characterised by changes in the secretion of the intestinal mucus. In this irritation, the mucous surface of the vascular, respiratory, and nervous systems generally, participate more or less, so as to give rise to the usual febrile phenomena.

When this fever is not subdued in the commencement, all the other mucous membranes, including those of the lymphatic glands and vessels, have a peculiar tendency to become implicated in the morbid action.

The adynamic fever depends on a high degree of irritation, tending to disorganization of the mucous membranes of the abdominal viscera. In this case, those of the brain and spinal marrow are soon involved in the morbid action going on; and therefore, the disease is attended with, and characterized by, nervous symptoms of the greatest intensity, already noticed while treating of cerebral or nervous fever.

This fever, then, is the result of irritation, in a high degree, of the mucous membranes, with its consequences, of the principal organs of the nervous system, and of those of the abdomen. It may be regarded also, as the advanced stage of any kind of fever running a fatal course, in which the symptoms by which it is characterized are usually developed; and they invariably depend on excessive irritation,

and its results, however induced, of the mucous membranes of the nervous and assimilating systems.

We have now shown, that the proximate cause of abdominal fever generally, is irritation, and its consequences, of the mucous membrane of the abdominal organs ; that that of bilious fever—especially, is irritation of the mucous membrane of the biliary organs—the peculiar symptoms of this fever being referrible to disordered action and secretion of those organs, while the general symptoms are accounted for by the doctrine of sympathetic actions.

We have also shown, that the proximate cause of mucous fever is, especially, irritation, and its results, of the mucous membrane of the abdominal organs, particularly of the stomach and intestines ; and that the general symptoms are referrible to the head of sympathetic actions.

The peculiar symptoms of this fever also, are caused by irritation of the mucous membranes of the organs in question, and their disordered secretions.

It has likewise been noticed, that Adynamic Fever, or (perhaps to speak more correctly) the adynamic stage of fever, depends on, or consists in, concentrated irritation, and its results, of the mucous membranes of the principal organs of the nervous system and abdomen ; in other words, that

violent and simultaneous irritation of the mucous membranes of those organs, is the proximate cause of the fever in question, or of its adynamic character.

This closes what I purposed saying in this place, with respect to abdominal or gastric fever. When I come to treat of symptoms and diagnosis, perhaps I shall have occasion again to refer to this subject.

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### ARTICLE III.—*Of Pulmonary, Catarrhal, and Pleuritic Fever.*

The Catarrhal fever is characterized by derangement of certain functions of the respiratory organs, and depends on irritation of the mucous membranes of the bronchia, lungs, and nasal organs; which accounts for the particular symptoms of cough, expectoration and coryza, which take place at some period of this fever. The general symptoms of this disease are referrible to the head of morbid sympathy, as has already been noticed while considering other fevers.

Another kind may be noticed under the head of Pulmonary fever. I mean, Pleuritic fever, which



is signalized by difficulty of breathing, and acute pain in some part of the chest, experienced in the act of inspiration. This affection peculiarly depends on irritation, and its consequences, of the fibro-serous membrane of the lungs; and its general symptoms are accounted for, by participation of the fibro-serous membranes, generally in the irritation excited in the pleura: thus the brain and heart sympathize in the increased action going on in the capillary vessels of the pleura. Either of these kinds of fever may be complicated with bronchitis, or inflammation of the parenchyma of the lungs.

As I omitted to do so, when treating of abdominal fever, I shall here notice, though somewhat out of place, Peritoneal or Puerperal fever. This affection, which is a very serious one, depends in a particular manner, on irritation, and its consequences, of the serous membrane of the abdomen. The general symptoms depend on general sympathy, excited in the manner explained under the head of Pleuritic fever; but the peculiar sympathy, and its consequences, which exists between the fibro-serous membranes of the brain and abdomen, accounts for the peculiar symptoms which are noticed in the graver forms of this disorder.

Here, I may observe, that though I have spoken of Catarrhal, Pleuritic, and Peritoneal fevers, I do not mean to assert that the affections of Pleurisy,

Catarrh, and Peritonitis do not occasionally exist, independent of fever, though they usually are attended with some degree of it, however slight ; but I only wish to call attention to those forms of fever in which irritation of the mucous membrane of the lungs and bronchia, and of the pleura and peritoneum, co-exist with, and strongly characterize, a well-marked train of febrile symptoms. With such cases, every experienced practitioner must be familiar.

Some, no doubt, will be disposed to call these disorders, fevers complicated with catarrh, pleurisy, and peritonitis. To these terms, I have no objection, but as I think these forms of fever can be shown to depend on irritation of the organs in question, and as many of their symptoms can be accounted for in no other way, than by reference to disorder of those organs, I am justified in applying to them the epithets which I have done.

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#### ARTICLE IV.—*Inflammatory or Vascular Fever.*

This is a disorder, the efficient cause (including both the predisposing and exciting causes) of which operates especially on the irritability of the mus-

cular parietes of the heart and arteries ; so that their functions are performed in an exaggerated manner. Whence the characteristic symptoms of frequent, strong, hard, full pulse ; greatly increased heat of skin ; high-coloured urine ; whilst the animal functions are not at all affected, and there is no loss of muscular energy. This is the synocha of Cullen, and the angiothenic fever of Pinel.

But although, in its commencement, this disease is marked by what are usually called, symptoms of reaction, strong arterial action ; yet the nervous and assimilating systems soon become involved in the morbid action, in case it is not cut short in limine. And then, the symptoms of reaction give place to those of collapse ; in other words, to the phenomena which characterize irritation, and its results, of the mucous membranes of the brain, alimentary canal, and their dependencies.

This is what was called Synochus, by Cullen, and Ataxic, or Malignant fever, by Pinel. Cullen describes it as "*Morbus contagiosus ; febris ex synochâ et typho composita, initio synocha, progressu et versus finem typhus.*"

In tropical climates this form of fever is very common, being the usual type of the yellow fever, occurring in new comers during very hot weather.

The proximate cause, then, of inflammatory fever is, irritation determined towards the muscular pa-

rieties of the circulating system. And this accounts for its peculiar symptoms.

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ARTICLE V.—*Rheumatic Fever.*

The peculiarity of this disease consists, as the proximate cause, in irritation, and its results, of the muscles and fibrous tissues about the large joints. As minor degrees of the local affection exist without fever, the constitutional symptoms of this disorder are to be attributed to morbid sympathy, called into action by the more intense degrees of it.

Experience shows that there exists a great sympathy between the muscles, the fibrous tissues, and the heart and arteries. Accordingly, pericarditis is found frequently to supervene on rheumatic fever. This fever is of the inflammatory type, and should be considered as a variety of inflammatory fever.

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ARTICLE VI.—*Glandular, or Muco-glandular Fever.*

This is a fever sometimes attended with malignant,

ataxic, or nervous symptoms; in other words, the phenomena of collapse. In this case it depends, in an eminent degree, as the primary proximate cause, on irritation of the abdominal mucous membranes and lymphatic glands, propagated subsequently to the other mucous membranes, as to that of the glandular system generally, and ultimately to that of the nervous system.

This is the Adenomeningic fever of Pinel.

The plague is an instance of the most exaggerated form of this complaint, characterised by glandular swellings, buboes, carbuncles, and other malignant symptoms, such as petechiæ, hemorrhages, colliquative diarrhœas, delirium, subsultus tendinum, coma, convulsions.

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#### ARTICLE VII.—*Erysipelatous, or Cutaneous Fever.*

This disorder depends on irritation, determined towards the cuticular texture. There are many varieties of it, such as scarlatina and the other exanthemata.

Here I may observe, that the eruptions on the skin, in these disorders, appearing, subsequent to the

constitutional derangement, does not at all militate against the doctrine, that irritation of the skin, whether directly or indirectly excited, is the proximate cause of the latter; for the eruptions are also one of the results of irritation producing inflammation.

The same observation applies to petechiæ, one of the results of cutaneous irritation, whether sympathetic or primary.

Nor is it necessary, in order to originate irritation in any given organ, that the irritating cause should be immediately applied to it.

Thus, the stomach being subjected to the action of an irritant, the diaphragm may become irritated, and act spasmodically, giving rise to hiccup.

Again, the mucous membrane of the stomach and bowels being subjected to the irritation of worms, various parts of the cuticular surface will be irritated in consequence.

I might cite numerous instances in elucidation of this law of the animal economy; but it is already so well known as not to render further proof necessary.

These are some of the most ordinary forms of fever; but it is rarely that a genuine example of any of them occurs in practice. For instance, a bilious fever, or one characterised by irritation of the mucous membrane of the biliary organs, is most



frequently attended with gastric and intestinal derangement, and sometimes with symptoms depending on irritation, and its results, of the mucous membrane of the brain. And a fever characterised by irritation of the mucous membrane of the nervous system will, not unfrequently, be accompanied with those which depend on irritation of the mucous membrane of the biliary organs.

As much may be said of the other forms of fever, —one complicating one at one time, and another another at another time, so apt is the affection of one organ to excite that of another, and thus to disorder the whole system.

Whence it must be evident, that the forms of fever may be indefinitely varied, according as they depend on the derangement of different organs, or different sets or structures of organs, complicating each other. And this is verified in practice; for fevers occasionally present themselves so anomalous, that it becomes exceedingly difficult to a candid observer to determine exactly to what class they belong. This, too, may account for the great discrepancy which appears in the opinions of certain professional men, in reference to these complaints.

When a fever is complicated, then, it appears the most reasonable plan, in determining its nature, to refer it to that class in the symptoms of which it abounds. Thus a fever, attended with varied symp-

toms, is to be styled a bilious fever, if the symptoms, characteristic of derangement of the biliary organs, are most pre-eminent. The same with regard to a fever, in which nervous symptoms are most marked.

But if the nervous and bilious symptoms, although predominant over the others, should appear to be equal with regard to each other, then, I think, propriety and accuracy of description require such a disease to be signalized by the epithet neuro-bilious, and so on with regard to others.

I shall now say a few words about continued, remittent, intermittent, and hectic fevers. These appear to be conditions, which refer more to the intensity than to the nature of fever, and they may qualify any form of fever. Thus a fever of a bilious form or nature may be either of the continued, remittent, intermittent, or hectic condition; in other words, it may be a bilious-continued, a bilious-remittent, a bilious-intermittent, or a bilious-hectic fever.

Here let no one be startled at the terms bilious-continued or bilious-hectic fever, merely because they are not in common use. Let us rather see if, by reference to facts, such distinctions can be proved to exist in nature.

It appears, then, that continued fevers are allowed on all hands to exist, although, from my own observations, I am inclined to believe that all fevers have

some remissions, be they ever so slight, and of ever so short duration. Admitting, however, that such fevers exist, and that they are most generally characterised by symptoms of vascular excitement, I think no physician, who has had an opportunity of witnessing the diseases of warm climates, will deny that such a fever is frequently complicated with symptoms of biliary derangement, in a high degree. This goes far to establish the propriety of the term bilious-continued fever, which would be better signified by the words, inflammato-bilious-continued fever.

There being no question about the propriety of the terms bilious-remittent and bilious-intermittent, as applied to fevers, I shall say nothing of them.

Now let us see if the term bilious-hectic can be maintained by reference to experience. And I think we have only to glance at that numerous class of valetudinarians, with sallow complexions, yellow conjunctivæ, costive bowels, high-coloured urine, habitually quick pulse, generally without cough and expectoration, evidently labouring under slow irritative fever, with a meridian and evening exacerbation, in order to be convinced of the fact.

Although this is a very numerous class of invalids in unhealthy tropical climates, the result of continued, remittent, or intermittent fevers ill cured, or of the abuse of stimulating drinks, &c., I think

a sufficient number of instances will be found in Europe, particularly among the officers on furlough, of the India Company's service.

It will appear from what has just been stated, that there is sufficient foundation for the admission of the continued, remittent, intermittent, and hectic conditions with respect to bilious fever. And if it is admitted in reference to this fever, it cannot be denied of any other kind of fever. Thus, we may have nervous fever, vascular, pulmonary, rheumatic, &c., all subject to the conditions of hectic, or intermitting, and continuing, or remitting.

What, it may be inquired, are the causes of these conditions?

We shall now endeavour to account for them, by reference to the nature of the irritations established in the organs which are the seats of the affections, shown to be the proximate causes of the fevers in question.

Now be it remembered, that these affections are nothing more or less than morbid irritation, and its consequences, of the different organs referred to, or of their different structures. Whence it must be conclusive, that an irritation of a continued nature, or one depending on a cause in continued operation, will give rise to a continued fever—to say nothing of the possibility of its leading to fatal consequences—and that an irritation of a remitting nature, or

one, the operation of the cause of which remits its force, will originate a remitting fever; that an irritation of an intermitting nature, or one the operation of the cause of which intermits its energy, will develop an intermitting fever; whilst an irritation of a consuming continued nature, or one the operation of whose cause, though not very intense, is yet continued and exhausting, will call into existence a hectic fever. The same effects take place, the irritating cause remaining fixed, if the irritability of the organs vary.

Thus, remission is the result of the irritability of the organs which are the seat of disease, becoming diminished for a time, and then recuperating its strength, the irritating cause remaining invariable, till at length, after successive diminution and recuperation, it becomes as it were exhausted for a longer or shorter time, so as not at all to feel the influence of the stimulant which first called it into exaggerated action. This last result is what gives rise to intermission, which applies to certain kinds of fever already noticed. In the meantime, the organ which was the seat of excessive irritation remains in a state of debility, torpor, and probably infarction. By reference to these principles may be explained the prevalence of one or other of those conditions of fever.

I may here remark that the conditions, remittent,

continued, intermittent, and hectic, are severally more prevalent in one form or kind of fever than another.

Thus, fever depending on vascular irritation is most frequently found to be of the continued condition; that depending on irritation of the mucous membrane of the lungs and bronchia, is generally of the hectic condition; that depending on intestinal irritation, and irritation of the absorbent system, is generally found to be intermittent; and lastly, that which depends on irritation of the mucous membrane of the biliary organs, is commonly of the remittent condition.

All this I admit to be true; but I am very far from allowing, that these conditions are invariably attached to the forms in question, and that they do not qualify other forms of fever.

As well might one argue, that, because it is natural to man to err, therefore, he can never do anything right; or that, because certain fish are usually found in the sea, therefore, they are never to be found in rivers or rivulets—both which conclusions are found to be contrary to the general experience of mankind.

This brings me to treat of the symptoms of fever.



## CHAPTER IV.

## OF THE SYMPTOMS OF FEVER.

THE term symptom is derived from the Greek words *συν*, with, and *πιπτω* I fall, implying I fall with, or occur together (as a symptom does) with the disease which it characterises.

Considered generally then, a symptom may be defined to be a sign or phenomenon, indicating the existence or operation of something not appreciable by the senses, and only inferred to exist or to be in operation from the effect or symptom to which it gives rise.

Thus, the phenomenon heat, appreciable by the sense of touch or feeling, is a sign or symptom of the presence and operation of the invisible principle, caloric.

Thunder and lightning are phenomena indicating the existence and operation of the invisible principle, electricity.

A symptom may be of two kinds, positive or negative.

Thus, the presence of heat is the positive sign of caloric, or the evidence of its existence and operation; and the absence of heat, or coldness, is its negative sign, or the symptom of its non-operation or absence.

So, accelerated pulse is the positive sign of irritation of the circulating system, and the absence of it is an evidence that it does not exist, or that its cause is not at the time in operation.

Symptoms being of different kinds, are objects of our different senses.

Thus, some of them being appreciable by the sense of touch only, can be judged of by a blind man; whilst others, being known to exist by the sense of the sight alone, can only be appreciated by an individual endued with vision.

There are frequently different symptoms of the same thing, each appreciable by a different sense.

Thus, heat and light are different symptoms of the existence and operation of caloric—one an object of sight, the other an object of touch.

There being, then, different symptoms of the existence of the same thing, each appreciable by a

different sense, and those symptoms being either of a positive or negative nature, we have ample means of convincing ourselves of the existence or non-existence of things, which, by their very nature, must for ever be removed from nearer inspection in our present state of being.

In considering the symptoms of fever, it will, perhaps, be proper, first, to refer them to the senses of which they are objects ; and then to the organs, the disorders of which they denote or characterise.

In order to comply with this design, I shall notice, in succession, symptoms which are objects of the sense of sight, of touch, of smell, of hearing, and of taste ; and then I shall refer them to the organs, the derangement of which they are symptomatic of. And this, by God's help, I shall do under five different articles.

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ARTICLE I.—*Of Symptoms, the objects of the sense of Sight.*

To this head are to be referred paleness of surface, in the cold stage of fevers, both in the commencement of intermitten and certain other fevers,

and in the closing scene, or stage of collapse, of those which are attended with great arterial action, or reaction, in their rise and during the early part of their progress; redness of surface, evident in the hot stage of fevers, marked by great arterial action or reaction; lividness, or dusky colour of the skin in certain congestive fevers; blueness of skin in the same fevers, or during the stage of collapse of fevers in general; petechiæ, cutaneous eruptions, in malignant and exanthematous fevers; critical sweats, manifested in great drops, at the termination of some fevers, whether in health or in dissolution; yellowness of the skin, &c., in yellow and bilious fevers; shivering or rigors; turgescence of different parts of the external form, and of the glandular system.

State of countenance—such as uneasy anxious expression; appearance of drunkenness; wildness; sullenness; moroseness; sadness; appearance of apprehension or fear; peculiar expression of one suffering extreme pain or agony; appearance of the eyes, as redness, pellucidness, yellowness, unnatural brilliancy, fulness, diminution of volume, sunken state, dryness, moistness, fixedness or continued mobility, strabismus; the eyelids are sometimes constantly closed, sometimes continually open; the pupils may be permanently dilated or contracted;

they may be sensible or insensible to the stimulus of light.

State of tongue, mouth, teeth, and lips.—The tongue may be larger or smaller than natural ; it may be white, white with red edges, red altogether, varying to any degree of redness ; it may be yellow, or black crusted ; it may be rough or smooth, foul or clean, &c. ; the teeth may be moist or dry, clean or dirty, crusted black, brown, or natural ; the mouth may be black, brown, or natural, partaking of the changes of the tongue and teeth ; the lips may be pale or red, swelled or the reverse, crusted or clean, puckered, thick or extremely thin.

State of the respiratory organs.—There may be dry cough, or cough with expectoration of mucus, purulent, or sanguineous matter ; slow or accelerated respiration ; dyspnœa ; orthopnœa ; painful respiration ; hiccup.

State of abdomen, alvine functions, and evacuations.—The belly may be swelled or natural, relaxed or tight in appearance ; there may be vomiting, retching, or belching ; there may be constipation or increased evacuation ; the matter vomited or passed downwards, may be either watery, alimentitious, excrementitious, mucous, bilious, sanguineous, purulent, or grumous, varying in colour and consistence.

State of urinary evacuations.—The urine may be abundant, natural, scanty, or altogether suppressed ; it may be pale, red, or bloody, charged with bile or mucus, and depositing various kinds of sediment.

The appearance of the blood may be thick or fluid, varying in colour from black to florid red ; it may be buffy or not, coagulating quickly or the contrary. The patient may be restless, continually throwing his limbs about, and the bed-clothes ; he may be affected with syncope or convulsions, spasms, irregular motions of the hands, such as picking of the bed-clothes, and pointing to different parts of the bed and chamber ; he may be delirious or comatose.

These are some of the symptoms noticed in fevers, appreciable by the visual organs, although many of them may be again mentioned as being appreciable by other senses.

No doubt some persons will have remarked, in the course of their practice, other symptoms which are not set down here ; and others will be disposed to refer certain of those just mentioned, to diseases independent of fever ; notwithstanding which, I think myself fully justified, while speaking of the symptoms of fever generally, in taking notice of them ; since they are found to characterize particular kinds of fever. The same symptoms, when existing alone, or in different combinations, may be said



to be characteristic of other diseases; but when they occur in combination with, or as sequences of, the phenomena commonly received as peculiar to fever, then they are said to be characteristic of particular kinds of fever, or of those which depend on particular proximate causes.

Let us now turn our attention to those symptoms which are objects of touch.

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ARTICLE II.—*Of Symptoms of Fever, objects of the Sense of Touch.*

Here we may notice—increased heat of skin; dryness, roughness, moistness, softness, smoothness, coldness, tumefaction or diminution of volume, of the external surface, extremities, and of the external form generally; increased or diminished heat, dryness, moistness, roughness, softness, smoothness, tumefaction, diminution of volume of the tongue and other parts of the oral apparatus; frequency or slowness, hardness or softness, weakness or debility, and other varieties of this nature, referrible to the state of arterial action and the

pulse, as palpitation of the heart, carotid and temporal arteries, epigastrium, &c. ; increased or diminished heat, increased or diminished volume, hardness, softness, roughness, smoothness, &c. of the abdomen, and some of its contained organs.

By pressure, a modification of this sense, we also ascertain the state of sensibility of some of the contained organs of this cavity, and of other parts of the body.

It is probable that other symptoms, referrible to this article, but not mentioned here, may occur to others.

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### ARTICLE III.—*Of Symptoms, objects of the sense of Smell.*

To this category belongs the odour of the breath, which is frequently fetid and hot ; that of the perspiration, which is sometimes ammoniacal, acid, peculiarly raw and offensive ; that of the urine, which may be garlicky, ammoniacal, or indicative of the presence of anything lately taken into the system ; that of the matter vomited, which may be acid, acrid, or peculiar, characterized by the nature of the ingesta ; that of the stools, which may be very

fetid, of various degrees of offensiveness, or they be natural, ammoniacal, or rawish ; that of the blood drawn, which may be natural or otherwise.

It is not unlikely that other instances of symptoms referrible to this head may occur to others.

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#### ARTICLE IV.—*Of Symptoms, objects of the sense of Hearing.*

Of this class are certain incoherent expressions during delirium, as muttering, groaning ; the noise accompanying shivering, coughing, vomiting, hiccuping, sighing ; hurried respiration, rattling in the throat, snoring ; stertor ; moaning ; borborymi, eructation ; forcible discharge of wind or other matter from the stomach and bowels ; particular noise attending the action of the body during convulsions ; the various sensations which the patient experiences, and with which he makes you acquainted, as pain in the head, back and limbs ; pain in the chest, side, breast, stomach, right or left hypochondrium, umbilical or hypogastric regions ; thirst, dryness of mouth, bad or bitter taste, hunger or anorexia,

sickness of stomach, inclination to vomit, colicky pains, tenesmus, inclination to urinate, sensation of cold in the back, on surface and in the extremities ; sensation of heat in the soles of the feet, and in the palms of the hands : internal and external pain, on pressure being made on different parts of the body, or the reverse ; restlessness, general uneasiness, disagreeable dreams, various conceits, fears, apprehensions and inclinations ; and other symptoms of this nature.

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ARTICLE V.—*Of Symptoms, objects of the sense of Taste.*

Though this sense might, no doubt, be made extensively subservient to the investigation of febrile phenomena or symptoms ; yet, in the present state of science, it cannot be said to be much made use of for this purpose. The effluvia, however, coming from the bodies and evacuations of certain fever-patients, occasionally affect the salivary organs so disagreeably as to give rise to an unpleasant taste in the mouth. This, I believe to have noticed in certain fevers of a putrid and malignant character, or such as depend on great derangement of the assimilating organs and of the nervous system.

I shall now consider the symptoms observable in fevers, with reference to the organs on whose derangement they depend, indicating, at the same time, on what sort of derangement they depend.

This task will be facilitated by the following division, viz: symptoms which depend on disorder of the brain and nervous system; those which depend on disorder of the stomach and assimilating organs; those depending on derangement of the heart and circulating organs; those which depend on disorder in the lungs and respiratory organs; such as depend on disease of the generative system and urinary organs; and lastly, symptoms which result from the disorder of certain excreting organs, such as the intestines, skin, &c.

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DIVISION I.—*Of Symptoms which depend on disorder of the Brain and Nervous System.*

Here are to be enumerated, headache, giddiness, fainting, pain, uneasiness, and numbness of the back and extremities; dreaming, delirium, coma, convulsions, wandering, muttering, stertor, optical illusions, picking at the bed-clothes, catching at imaginary objects, pointing to different parts of the bed or chamber, as if at something present, but evidently the effect of optical illusion.

All these various symptoms, as well as others of the same class, depend on three different states or conditions of the different organs composing the nervous system. For instance, headache depends on increased action of the capillary vessels of the fibro-serous membrane of the brain, giving rise to morbidly increased sensation or pain. Giddiness depends on diminished action of the same vessels; fainting or syncope, on suspended, or probably retrograde action of the capillary vessels of the fibro-serous membrane of the brain; whence result loss of the mento-organic faculty of sensibility, and of the animo-organic function of sensation; the mento-muscular faculty of mobility-at-will, and of the animo-organic function of voluntary motion; the total suspension of the animo or mento-organic faculties, and of the animal, or more properly speaking, the animo-organic functions; and the disorder or suspension of the senses. Pain of back depends on excessive action of the capillary vessels of the fibro-serous membrane of the spinal marrow, whence results morbidly increased sensation. Uneasiness or numbness of the back and extremities depends on diminished action of the extreme vessels of the fibro-serous membrane of the spinal marrow, and of that of the nerves of sensation which supply the limbs. Diminution or loss of voluntary motion may depend either on diminution or suspension of the action of



the extreme vessels of the fibro-serous membrane of the nerves of volition, whence their contractile fibres cease to obey the stimulus of the will ; or on diminution or suspension of the irritability of the muscles of voluntary motion ; whence their contractile fibres cease to obey the fiat of the will, transmitted to them by the contraction of the fibres of the nerves of volition. Dreaming and delirium, are modifications of the same state of the encephalon.

Dreaming depends on increased action of the fibro-serous membrane of the capillary vessels of the brain during imperfect sleep, not sufficiently increased, indeed, to excite morbid sensation, but enough so to agitate the mind ; of which the action or repose is intimately associated with the condition of the extreme vessels of the fibro-serous membrane of the brain.

Delirium depends on the same condition of the brain while awake, (or when the sensual organs are alive to the impression of surrounding objects,) as dreaming does during sleep.

Coma depends on suspended action of the extreme vessels of the mucous membrane of the brain, inducing congestion or its consequence, effusion.

Convulsions depend, either on diminished action of the extreme vessels of the fibro-serous membrane of the nerves of volition, in consequence of which their irritability is diminished ; or on diminished

irritability of the contractile fibres of the muscles of voluntary motion ; in consequence of which, they are unable regularly to obey the stimulus of the will, communicated to them through the medium of the nerves in question.

Muttering depends on the causes of delirium joined to irregular action of the muscles subservient to the voice.

Stertor depends on the causes of coma impairing the action of certain of the respiratory muscles, particularly those of the velum pendulum patali, which appears to be passive during the act of inspiration in this case.

Optical illusions depend on irregular or excessive action of the fibro-serous membrane of the visual nerves ; whence the functions of the visual organs are imperfectly performed, or they are performed in an exaggerated manner.

Picking at the bed-clothes, catching at imaginary objects, and pointing to different parts of the bed or chamber—these symptoms depend on the causes inducing optical illusions, joined to irregular action of the contractile fibres of the motory nerves of the arms, hands, and fingers, and to diminished irritability of their muscles ; whence their functions, prompted by imperfectly transmitted volitions, are imperfectly performed.

DIVISION II.—*Of Symptoms depending on disorder of the Stomach and Assimilating Organs.*

These consist in pain of stomach, retching, belching, vomiting, increased appetite, anorexia, fastidiousness or loathing; thirst, hot and fetid breath; suppression of bile, of saliva, and other secretions; increase of these; alteration or changes in the quality of these; pain of right or left hypochondrium; numbness and heaviness of the same; stitches or irregular sensation of the same; violent and continued pain across the belly, or in the right or left iliac regions; pain on pressure of the belly; whiteness of tongue, redness of the same, dryness, moistness, heat and coldness of the tongue and breath; blackness or otherwise altered colour of the tongue, teeth, and lips; redness or pain of the lips; thickness, puckered state or thinness of these; yellowness of the skin and eyes; appearance of bile in the urine and stools; appearance of mucus, pus, or blood in any of the secretions or excretions; black stools and black vomit.

Pain of stomach depends on excessive action of the capillary vessels of the tissues entering into the composition of its fibro-serous parietes, which are more intimately connected with the nerves subservient to sensation, as the muscular and serous coats. The mu-

cous coat appears to be more intimately in connexion with the ganglionic, or the system of the great sympathetic nerve, the nerve of association and organic life ; in which the action of its extreme vessels may be excessively augmented without being immediately communicated to the sensorium commune, in other words, without causing pain ; but, on the contrary, it is more apt, when irritated, to excite the action of other organs, supplied with branches from the same nerve, or in any way connected with it, of which the mucous membranes of the brain, liver, spleen, and lungs, and of the intestines, and the other abdominal viscera, the absorbent system, the heart and circulating system, are instances. Accordingly, we find that the increased action of the capillaries of the mucous membrane of the stomach does not occasion pain of the stomach ; but, on the contrary, it is propagated to the mucous membrane of the brain ; the capillary vessels of which take on excessive action, and by consequence become torpid, and give rise to pain of the head, the result of excessive action of the extreme vessels of the fibro-serous membrane of the brain ; because the action of the extreme vessels of this membrane is more intimately connected with the mental, or more properly speaking, the animo-organic function of sensation than that of those of the mucous membrane of the brain, which is more connected with the organic functions of assimilation, secretion, &c., all of which go on without exciting sensation.

This digression may not be altogether useless here, as by reference to the laws just indicated, many of the phenomena of fever can readily be explained.

I shall now proceed to account for the different symptoms depending on disorder of the stomach and assimilating organs. Retching, belching, vomiting, depend on irregularity and inversion of the peristaltic or vermicular action natural to the healthy stomach, and which is the result of the due contraction of the fibres composing its muscular parietes, having for its object the propulsion of the contents of the stomach onwards to the small intestines. I say, that vomiting, retching, and belching, depend on irregular or inverted action of the stomach, and are attended with a sensation of sickness, varying in degree, probably the result of retrograde action of the contractile fibres of the par vagum.

Increased appetite, anorexia, fastidiousness, or loathing, depend on increase, diminution, and probably a slight degree retrogression, in the action of the contractile fibres composing the muscular coat of the stomach, induced by opposite conditions of its mucous coat and secreting glands, and thus giving rise to similar conditions of the contractile fibres of the par vagum or pneumo-gastric nerve, which is the immediate cause of the peculiar sensations in question.

Thirst depends on the increased evolution of animal heat which takes place during certain states of increased action of the mucous coat of the stomach, unattended with secretion, stimulating the contractile fibres of the par vagum distributed to its muscular coat, and thus occasioning this symptom.

Hot and fetid breath depends on the abnormal generation of heat during certain states of excessive action of the capillaries of the mucous membranes of the stomach, lungs, and bronchia, unattended with secretion, and the changes the heat so generated produces on the matter previously present in these passages. I say, that hot and fetid breath is the result of excessive heat and the changes produced by it, on the matter contained in the mucous cavities of the stomach, lungs, and bronchia.

Suppressed or increased secretion of bile, saliva, and other secretions.—Suppressed secretion of bile depends on two very different conditions of the extreme vessels of the liver. It may be the result of torpor, such as takes place on the skin in the cold stage of intermittents, or of excessive action abortive of secretion, as is noticed in the skin during the hot stage of fever, attended with increased evolution of heat before perspiration breaks out. The same may be said of suppression of the saliva and



the other secretions, in reference to the organ which secrete them.

Increase of bile and saliva are the results of an action more vigorous than the healthy action of the capillary vessels of the liver and salivary glands, but not so excessive as to be abortive of secretion. Increased secretion is observed to take place when this very excessive action (abortive of secretion) is falling; in other words, when the action has become more moderate, but is still more vigorous than normal. Morbid changes in the quality of the secretions are the results of trains of morbid action, and are observed to take place as the sequelæ of inflammation.

Of inflammation, I may offer this as an idea—suppose an organ, in the healthy state, consisting of nerves of sensation, and capillary vessels endued with irritability or the property of contracting when stimulated, and secreting certain fluids by means of certain normal actions or contractions excited by a certain degree of stimulation, but liable to have these actions or contractions interrupted, diminished, or exaggerated by diminution or augmentation of the due degree of stimulation necessary for the performance of its appropriate function — moreover, suppose the irritability or property of contracting when irritated, capable of being increased or dimi-

nished, from time to time, by the operation of whatever causes,—suppose all this, I say, and we shall be able to give some account of what takes place in inflammation. Thus, to the healthy liver, shall be applied a stimulant which shall at first increase the flow of bile. This stimulant continuing to operate, or the irritation increasing, the action shall be carried so far as to suspend secretion, though from the excessive action, increased heat results. The stimulant continuing to operate still further, at last, suddenly exhausts the irritability of the vessels ; which ceasing to obey the stimulation, cease to act or contract upon their contents ; but, on the contrary, the blood rushes into their torpid canals ; and overcoming, by its pressure, their elasticity, dilates them and stagnates there, being abortive of all action and secretion. This state does not last long ; but the vessels, after a certain repose, recovering their irritability, begin to react. Now, however, they are not able to remove the unnatural accumulation ; but, after struggling in the unequal contest, for more or less time, their irritability becomes again exhausted, and they fall into a state of greater debility and infarction than formerly. This reaction, torpor, and debility, with consequent dilatation of their calibres, go on alternating, in an increasing ratio, till the emunctories or secreting extremities of the extreme vessels become so en-

larged or dilated, as to pour out their contents, more or less altered in quality by the previous exaggerated action and succeeding torpor, during one of the paroxysms of reaction which ensues.

This is the complex idea which I entertain of inflammation and its results; but I shall perhaps, in another place, have occasion to dwell more at large on this subject; and I think I can prove all that I have here supposed; so, also, may others if they would take the trouble.

The pain which attends the morbid action of the capillary vessels in inflammation, is occasioned by that action or motion being communicated to the sensorium commune by means of contractions or vibrations excited in the nerves of sensation with which the affected organ is supplied. Whence it is evident, that if the organ affected with inflammation have no nerves of sensation, no pain will be experienced.

I shall now continue to account for the symptoms depending on disorder of the stomach and assimilating organs.

Pain, numbness, irregular sensations, or stitches in the right or left hypochondrium.

Pain of the right hypochondrium is referrible to excessive contraction ending in torpor of the extreme vessels of the parenchyma of the liver, communicated to the mind by means of similar contrac-

tions or vibrations excited in the branches of the par vagum which supply this viscus; or transmitted to the nerves of sensation which are distributed to the parts in the immediate vicinity of the liver; as, for instance, the abdominal parietes.

Stitches depend on irregular action of the same vessels communicated to the mind by similar conditions of the sensitive nerves of the part affected. Numbness, on torpor of the same vessels communicated to the mind in a similar manner. Similar sensations in the left hypochondrium are referrible to similar conditions of the spleen, communicated to the mind in a corresponding manner. Violent and continued pain across the belly, and in the right and left iliac regions, are symptoms depending on excessive action of the fibres composing the muscular parietes of the transverse, ascending and descending colon, communicated to the sensorium by means of morbid contractions or vibrations of the fibres composing their nerves of sensation. This condition of the muscular coat of the colon depends on suspended action of the capillaries of its mucous coat, the result of any cause which may have produced over-excitement of them, as, for instance, the presence of acrid matter, crude ingesta, &c.

Whiteness, redness of tongue, whiteness of its body with redness of its edges, dryness, moistness, and increased heat of tongue, with coldness and

hotness of breath. Each of these symptoms depend on modified action of the capillaries of the different organs to which they relate. Thus, whiteness depends on increased action of the extreme vessels of the mucous membrane of the tongue, (with which that of the stomach and other intestines coincides ;) whence the mucus is secreted in greater abundance ; but the watery parts of it being dissipated by the increased heat which attends increased action, it becomes inspissated, and consequently altered in colour, and thus furnishes a white coating to the tongue and other mucous surfaces. Redness depends on excessive action of the extreme vessels of the mucous membrane, abortive of all secretion ; whence the natural mucus is dissipated by the attendant heat, and the attrition of the tongue against the roof of the mouth, teeth, and the morbidly injected membrane, causes the red appearance in question. Whiteness of its body, with redness of edges, depends on the teeth rubbing off the white coating round the edges, leaving the centre covered with it. Dryness depends on suspended secretion, the result of over-action of the capillary vessels. Moistness depends on natural or moderately increased action of the capillary vessels, or on their morbid relaxation, the result of their irritability being exhausted in consequence of previous over-action. Heat depends on activity of the extreme

vessels; coldness on their torpor. Cold breath depends on the passage of the expired air over the inactive mucous membrane of the bronchial tubes. Hot breath depends on the passage of the expired air through bronchial tubes, of which the mucous membrane is in a high state of excitement.

Blackness, or otherwise altered colour of the tongue, lips, teeth, &c.—These appearances are the results of morbidly changed action of the extreme vessels of the investing membranes of the tongue, mouth, and fauces; whence their secreting or absorbing extremities become debilitated and dilated, so as to pour out their contained fluids more or less morbidly modified in the forms of purulent matter, pure or mixed with blood, venous blood, arterial blood, like grume or tar, pure or mixed with aqueous matter, presenting the appearance of ground coffee mixed with water.

Redness or paleness of the lips depends on increased or diminished action of the extreme vessels of the epithelium, with increase or diminution of their contained fluids.

Thickness of the lips depends frequently on that state of their extreme vessels in which their irritability being exhausted, their contained fluids dilate them and stagnate there—in this case they are of a livid colour. They may be thick and red,



but this state depends on reaction taking place after debility and consequent congestion of fluids in the vessels have previously existed.

Puckered lips depend on permanent contraction of their voluntary muscles, the result of fixed irritation in the base of the brain—it is a bad symptom.

Yellowness of the skin and conjunctival investment of the eyes depends on increased secretion of bile; which not passing into the duodenum, in consequence of some obstruction in the common biliary duct, hepatic or cistic duct, is carried by the absorbent vessels of the liver into the general mass of circulating fluids; and, in this manner, appears in all the other secretions, and even in the capillary vessels of the surface, which, under ordinary circumstances, are charged with colourless fluid.

What has just been said of yellowness applies to that deep yellow of the skin which characterizes bilious affections. There is, however, another kind of yellowness, a pale yellow or straw colour, characteristic of malignant diseases, which occasionally affects the skin and conjunctiva towards the close of fatal cases of the yellow fever. This state is owing to the retention, in the circulating mass, of the elements of the bile, in consequence of the excessive action which prevails in the heart and arte-

ries, as well as in the capillary vessels generally, during this malady, (which indeed constitutes the very essence of it,) having been abortive of the biliary secretion.

Appearance of bile in the urine, stools, &c., will easily be accounted for from what has been stated.

Appearance of mucus, pus, &c., in any of the other secretions—black stools and black vomit. These phenomena will readily be accounted for by reference to general principles already inculcated in a former part of this treatise, and particularly to what has just been stated, while speaking of blackness or otherwise altered colour of the tongue, lips, and teeth.

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DIVISION III.—*Of Symptoms depending on Disorder of the Heart and Circulating Organs, including the Capillary Vessels.*

These are increased or decreased frequency of pulse; increased or diminished vigour of pulse; irregular, suspended, or interrupted pulse; palpitation; increased or diminished heat; swelling with pain and tension; swelling without pain and tension, or what is the same thing, swelling with

relaxation ; increased, decreased, suspended or disordered, and vitiated secretion ; gangrene ; death.

Increase or decrease of the frequency of the pulse, depends on increase or decrease of morbid irritability in the contractile fibres composing the muscular parietes of the heart and arteries, with respect to any given stimulant.

Increased or diminished vigour of pulse, depends on increase or decrease of healthy irritability in the contractile fibres of the heart and arteries, with respect to the same stimulant.

So that the stimulant remaining unchanged, anything that increases or diminishes the morbid irritability of the circulating organs, will give rise to increased or diminished frequency of pulse, while anything that increases or decreases the healthy irritability of the same organ, the stimulus remaining fixed, will increase or decrease the vigour of the pulse, and vice versâ ; the irritability, whether morbid or healthy, remaining fixed, whatever increases or diminishes the stimulus, will increase or diminish the frequency or strength of the pulse.

Irregular pulse depends on irregular contraction of the fibres of the heart and arteries, generally the result of debility or, what is the same thing, of the want, either of a regular supply of morbid irritability, or of due stimulation.

Suspended or interrupted pulse depends either on

temporary suspension of the irritability of the heart and arteries, or temporary withdrawal of the due degree of their accustomed stimulus.

Palpitation depends on irregular contraction of the heart, generally the result of temporary diminution of morbid irritability. Increased heat depends on increased action of the circulating vessels, at least, it is always found to accompany increased action of the heart and arteries.

Swelling with pain and tension is the result of increase of fluids in the capillary vessels of any part, attended with reaction of the said vessels on their contents; this state is also attended with increased heat. Swelling, on the contrary, without pain and tension, is the result of increase of fluids in the extreme vessels of any part, unattended with reaction of them, on their contents; this state is marked by decrease of natural heat. Increased, decreased, or suspended secretion, depend on increased, decreased, excessive, or suspended action of the capillaries of any given part; disordered or vitiated secretion is a result of trains of morbid action already noticed, while speaking of inflammation.

Gangrene is one of the results of inflammation, when all the vital actions and functions, such as contraction, sensation, circulation, and secretion, being suspended for more or less time, without the

possibility of reaction taking place, the fluids and solids fall into a state of decomposition and disorganization, while the capillary vessels of the adjoining parts performing their natural functions in an exaggerated manner, a separation of the sphacelated part is effected.

Death will be considered under the head of the results of fever.

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DIVISION IV.—*Of Symptoms which depend on disorder of the Lungs and Respiratory Organs.*

These are cough, expectoration of mucous or purulent matter, blood, &c. ; frequent or slow respiration ; sighing ; panting ; rattling ; interrupted respiration ; asphyxia ; uneasy, difficult, painful, respiration ; hot or cold breath ; fetid breath ; wheezing ; snoring ; hiccup ; yawning ; groaning ; moaning.

Cough depends on repeated forcible contractions of the abdominal muscles and diaphragm, the pectoral and intercostal muscles remaining fixed, produced by irritation of the extreme vessels of the mucous membrane of the bronchial tubes and pul-

monary cells, of which the object is the expulsion or removal of the irritating cause.

Expectoration of mucous or purulent matter and blood, &c., is effected by cough ; another term for it is humid cough. It is excited by irritation of the bronchial tubes and air-cells of the lungs, caused by the presence of some irritating matter, communicated to the muscles of forcible respiration, as, for instance, excess of the natural mucus, purulent matter, blood, or any other foreign matter, and it has for its object the expulsion of them from the lungs.

Frequent and slow respiration.—The former depends on anything which excites the respiratory organs, and calls into action its muscular apparatus, as increased action of the heart and arteries, irritation of the mucous membranes of the stomach and bowels, &c. ; the latter depends on deficiency of irritability in the respiratory organs ; or, this remaining unchanged, on deficiency of their natural stimulus, (i. e.) the quality of the circulating fluid, and that of the inspired air. It may also depend on the condition of the other vital organs, and of the stomach, with which the lungs are associated in action.

Sighing is the result of deficient irritability in the lungs, or of a reduction of the stimulating quality of the circulating fluid, or of the air ; whence



it happens, that respiration does not go on easily ; so that, from time to time, the patient feels constrained to make voluntary prolonged inspirations, in order to relieve the disagreeable sensation caused by the accumulation of venous blood in the lungs. This symptom may also be dependent on the state of the circulation at the base of the brain, the irritability of the lungs, and the stimulating quality of the blood and of the air, remaining normal. It is in general an unfavourable symptom in fever, marking great oppression of the nervous system, and consequently of the heart and arteries.

Rattling is caused by a morbid increase of mucous or other matter in the air-passages, without energy, on the part of the system, to effect its expulsion by coughing, so that the air, in passing in and out of the lungs, mechanically agitates the matter in question, and thus gives rise to this symptom, which attends the last moments of persons dying of fevers dependent on, or complicated with, disease of the lungs, &c.

Suspended respiration, asphyxia.—The proximate cause of this is deficient irritation in the mucous membrane of the lungs, whence the muscular respiratory apparatus is not excited to action. This may depend on two causes, either on deficiency of irritability in the lining membrane of the lungs and bronchia, or a reduction of stimulating

quality in the circulating fluid or in the air ; so that in neither case are the extreme vessels of the mucous membrane of the lungs and bronchia excited to action ; and, by consequence, no propagated action results in the muscular respiratory apparatus ; whence the elasticity of the pulmonary structure, and the pressure of the circumambient air, cannot operate in dilating the lungs, so as to allow the blood to pass to the right cavities of the heart. The result of all this is stagnation of the blood in the heart, brain, and lungs ; which condition of things cannot last long without destroying life.

Difficult, painful, respiration.—Difficult respiration takes place, when any of the conditions necessary to the proper execution of this function are deficient. Thus the air being deficient in stimulating quality, the irritability of the mucous lining of the bronchia and air-cells of the lungs being impaired, the presence of extraneous matter in the air-passages impeding the entrance of the atmosphere into the lungs, may be cited as causes of difficult respiration.

Painful respiration depends on increased irritability of the nerves distributed to the fibro-serous covering of the lungs, and results from an opposite condition of the capillary vessels of the fibro-serous coat itself ; so that the ordinary respiratory acts give

rise to morbidly increased sensation. Painful respiration may occasionally depend on a similar condition of the contractile fibres of the extreme vessels of the respiratory muscles, and of the ligaments of the ribs, whence results an opposite condition of the contractile fibres of their nerves of sensation.

Hot and cold breath.—These phenomena depend on the causes of increased or decreased heat in the air-passages, already noticed in another part of this treatise.

Fetid breath has already been noticed in another place.

Wheezing depends on the presence of mucous or other viscid matter in the smaller branches of the bronchia, which being agitated by the ingress and egress of the air, in passing to and from the lungs, gives rise to this symptom.

Snoring depends on loss of irritability, and consequent relaxation of the soft palate, whence it is agitated by the passage of the air over it, to and from the lungs, so as to occasion the harsh hoarse sound in question. This symptom is connected with an oppressed state of the circulation at the base of the brain; it occurs in the states of coma, apoplexy, and intoxication.

Hiccup depends on spasmodic or irregular action of the diaphragm, and probably of the other inspiratory muscles; this is caused by deficient irrita-

bility in their contractile fibres, so that, not obeying their ordinary stimulant, in an equable manner, they are constrained to act spasmodically or irregularly, giving rise, in this manner, to a forcible and quick entry and exit of air, to and from the lungs, agitating, in a distressing manner, the whole frame.

This is a very dangerous symptom, when it is accompanied with irregular action of other parts of the body, showing a deficiency of irritability in the nervous system, by which that of the system in general seems to be very much influenced.

Yawning, groaning, moaning, appear to be ordinarily involuntary actions, (though they may be produced at will,) of which the final cause seems to be, the relief of uneasiness in some part of the system. Yawning is increased action of some, and decreased action or relaxation of others, of the muscles of the jaws and cheeks, in order to remove an uneasy sensation in the fauces and chest, by the admission of fresh air, and is generally accompanied with stretching of the limbs. Groaning and moaning are varieties of the same phenomenon. This is produced by strong and prolonged contraction of the abdominal and thoracic muscles, whereby the diaphragm is forced up, and the ribs drawn down, compressing the lungs, and gradually expelling the contained air, through the nostrils or mouth, as the case may be ; and, thus, affecting the flow of blood

through the heart, and, consequently, the circulation of the brain ; where, being impeded in its progress, it diminishes the irritability of it, and, by consequence, assuages pain ; which is invariably the result of increased irritability in some part of the nervous system. The only difference between moaning and groaning appears, to me, to be, that in groaning the mouth is kept closed, in moaning, it is opened.

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DIVISION V.—*Of Symptoms resulting from Disorder of the Urinary Organs.*

Increased, diminished, or suppressed secretion of urine.—Increased secretion depends on increased action of the secreting vessels of the kidneys ; diminished secretion depends on diminished action of the same vessels ; suppressed secretion depends on two different states, suspended and violent action, each invariably abortive of secretion.

High-coloured, bloody urine. — High-coloured urine is the result of reaction succeeding, in the kidneys, to collapse ; when the secreting vessels, after having been in a state of previous debility, torpor, and dilatation, on reassuming their action, force out of their relaxed emulgent extremities, a

small proportion of blood; which, being incorporated with the urine, gives rise to the high colour in question. Bloody urine depends on a greater quantity of blood coming from the relaxed emulgent vessels of the kidneys, or from the extreme vessels of the mucous membrane of the ureters and bladder. Indeed, the secretion of urine may be replaced by a secretion of what appears to be nearly pure blood, or blood so slightly altered in its sensible qualities as to be taken for such. Urine mixed with mucus is the result of increased secretion of this matter from the mucous lining of the containing organs of the urine, and may probably be determined by the irritating quality of the renal secretion.

Urine mixed with bile, is the result of the bile secreted by the liver, not finding its way into the duodenum, in consequence of the existence of some obstruction in the biliary ducts, but being taken up by the hepatic absorbent vessels, is carried into the general mass of circulating fluids; and, in this manner, it is found colouring, not only the urine, but, also, the skin, conjunctiva, and other secretions.

Pale urine seems to depend on simply increased action of the kidneys without any previous collapse or debility existing, or the presence of any other secretion in the circulating fluid.

Hot urine is determined by increased action in the



extreme vessels of the passages which it pervades, before being evacuated.

Pain in the lumbar regions is the result of increased irritation of the sentient nerves of the sero-fibrous structures of the kidneys, depending on decreased action of the capillary vessels of the mucous membrane of that organ, the result of their previous over-action.

Pain, on pressure of the hypogastric region, depends on increased irritability of the sentient nerves of the bladder, caused by diminished action of the extreme vessels of its mucous membrane, the result of their previous over-excitement, one of the consequences of that train of morbid actions called inflammation, characterized first by increased, and then by diminished action and injection of the capillary vessels.

Swelled breast is the result of irritation of the capillary vessels of this organ, and may be directly or sympathetically excited. In the latter case, it results from irritation of the uterus, and is attended with a train of morbid actions, commonly called milk fever, in the puerperal state.

DIVISION VI.—*Of Symptoms depending on disorder of certain of the Excreting Organs, as the Skin, small and large Intestines.*

These consist in dryness, heat, paleness, redness, roughness, coldness, moistness of skin, various cutaneous eruptions, tenderness, numbness of surface, sensation of heat, sensation of cold, costiveness, looseness, fruitless efforts to evacuate the bowels, tormina, the matter evacuated, tenesmus, tenderness, fulness of abdomen.

Dryness of skin depends on two opposite conditions, too great and too little action of the extreme vessels composing its secreting apparatus. Too much action is productive of suppression of perspiration, increase of heat, and consequent dryness, roughness, and redness of surface. Too little action is equally productive of suppressed perspiration, but in this case there is a diminution of the natural heat, and the surface is cold and pale.

Roughness is caused by the extreme vessels of the skin, particularly their emulgent extremities, contracting so forcibly on their contents as to give rise to a puckered or constricted state. This furnishes an idea of spasm.

Moistness depends on different states, moderate action, relaxation, and probably retrograde action of the extreme vessels of the secreting apparatus of the skin. In the former case, the perspiration is warm; in the latter, it is cold, and sometimes clammy, in which last case the skin is either of a livid or pallid aspect. If reaction does not shortly take place, this state augurs approaching dissolution. Under such circumstances, it is possible to conceive of the extreme vessels of the cutis pouring out drops of blood in a paroxysm of reaction, or during the last struggles for life.

Various eruptions depend on irritation and its results, of the cutaneous glands, and other minute organs situated on the surface of the body.

Tenderness, numbness of the surface.—Tenderness depends on increased irritability of the sensitive nerves of the skin, in consequence of which the slightest impressions from external agents give rise to increased sensation. Numbness depends on diminished irritability of the sensitive nerves of the cutis, in consequence of which impressions from without are not readily transmitted to the sensorium or mind.

Sensation of heat in the skin.—This depends conjointly on the state of irritability of the sensitive nerves of this organ, and the state of the circulation in different parts of the body. One thing, however, is certain, viz. that the skin may be burning hot,

and yet the patient may feel cold, or it may be icy cold, and he may feel intolerably warm. It appears to me, therefore, that it must be admitted as a fact, that such sensations are the result of the morbidly irritable state of the nerves, or, these remaining in a normal condition, they depend on an abnormal state of the capillaries of some other part of the body, in connexion with them. Thus, occasionally, in Asiatic cholera, the surface is icy cold, and the patient cannot support the impression of anything warm. Does not this depend on the state of the nervous system? Indeed, it seems to me, that, at least, the fatal cases of this disease are the result of irritation commencing in the capillaries of the mucous membranes of the stomach and bowels, and of the other abdominal viscera, not alternating with increased and diminished action of the capillaries of the skin, (as takes place in intermitting fevers,) but propagated first, to the extreme vessels of the muscular parietes of the intestines, and, subsequently, to the extreme vessels of the fibro-serous membrane of the nerves, giving rise, as a consequence, to (that train of morbid events called) inflammation of the membranous part of (the different organs which compose) the nervous system.

Nor does the idea, that the predisposing cause of cholera is an impoverished or depraved condition of the blood, (so that it is unable to maintain the

healthy irritability of the organs to which it is distributed in the course of circulation, whence torpor of the capillary vessels, and consequent venous congestion, is induced), at all militate against this opinion. For it signifies not whether the capillaries of the mucous surfaces of the viscera in general, be, in the first place, irritated by the stoppage of the blood in the venous trunks, leading from them to the heart, or by any other cause. It is enough, for my purpose, to show that irritation, however induced, exists in them, and that it is transmitted, by whatever means, to the nervous system. And this opinion appears, to me, to be supported by the fact, that when reaction, with determination to the skin, takes place, all the graver symptoms of cholera cease. This opinion respecting the nature of cholera, is further supported by the advantage said to result from the injection of saline solutions into the venous system, in the course of this disease. For how do these operate in effecting the cure? Simply by stimulating the heart and large venous trunks, and, in this manner, (acting as counter-stimulants,) producing a determination of blood from the oppressed capillary vessels of the abdominal mucous membrane, and viscera in general, towards the heart, along the large venous trunk; and, thus, re-establishing the equilibrium of the circulation. I cannot see how else they act, since they materially

affect the pulse and heat of the body, whilst they relieve all the other characteristic symptoms of the disease.

Costiveness depends on suspended action of the contractile fibres composing the muscular parietes of the intestines, in consequence of which their contents are not driven forwards—it may co-exist, and generally does, with excessive action of the capillaries and glands of the mucous membrane. Constipation is a variety of costiveness, which depends on an entirely opposite proximate cause, that is, excessive action of the contractile fibres composing the muscular coat of the intestines, in consequence of which the peristaltic motion (requisite for the proper evacuation of the bowels) becomes disordered and inverted, as is the case in the disease called ileus. Looseness depends on increased action of both the muscular and mucous coats of the intestines.

Tormina and fruitless efforts to evacuate the bowels, depend on irregularly increased or spasmodic action of the muscular parietes of the colon and small intestines, whilst their mucous coat is quite inactive, as is the case in the dry belly-ache or colica pictonum.

The matter evacuated from the bowels is either excrementitious, or the effect of healthy or morbid secretion, such as fœces, mucus or bile, serous matter, purulent matter, pure blood, or blood some-



what modified in the course of morbid secretion or exudation, such as the black matter of typhus and yellow fever. These substances may be variously combined, giving rise to an almost infinite variety of appearances. The differences observed in their odour depend on delay in the abdominal passages, together with the effects produced on them by morbid heat, and, sometimes on an impure state of the blood, from which they are separated.

Tenesmus depends on excessive action of the lower extremity of the muscular parietes of the rectum, its mucous coat being in a state of congestion and consequent torpor.

Tenderness, fulness, hardness of abdomen. Tenderness may depend respectively or conjointly on increased irritability of the sensitive nerves of the muscular and serous parietes of the belly, and, probably, on that of the muscular coat of the intestines, the result of congestion and consequent torpor and diminished irritability of the capillary vessels of the respective organs which they connect with the sensorium.

Fulness depends either on a loaded state of the bowels, or on a congested state of the capillary vessels of one or more of the abdominal viscera.

Hardness depends on a state of permanent contraction of the muscular parietes of the abdomen, caused by irritation directly and sympathetically excited in them.

## OF SYMPATHY AND ALLOPATHY.

HAVING enumerated the causes of the different symptoms, and shewn in what states of the different organs they consist ; it remains now to be observed, that these states may be either directly or indirectly induced ; that is, either by causes operating immediately on the organ, the derangement of which is produced ; or mediately, through the medium of any other organ more or less intimately associated with it, in the state of health. Now all the organs of the body, in health, may be said to sympathize, act or suffer together ; since the very idea of health involves that of the due and simultaneous performance of their particular functions, by the several organs of the system. But the actions of some of them are so intimately associated, and their simultaneous action so indispensable to the continuance of life, that any of them cannot be disordered without involving the disorder of the others, and thus endangering the very existence of the patient.

Of this class are the actions of the heart and large arterial and venous branches, the lungs, the brain, and, I may add, the stomach, by reason of its close connexion with the brain. These organs are said to be, in a peculiar manner, sympatheti-

cally connected with one another. Thus, whatever disturbs the circulation of the blood affects the lungs; and whatever impairs the action of the brain disorders the heart's action, and the respiration; and whatever deranges the respiration disturbs the functions of the brain and circulating organs. So, also, if the stomach be deranged, the brain is first affected, and then the heart and respiratory organs. The same law of sympathy holds good between the skin, intestines, and other abdominal viscera; and, also, between many other organs, and the different structures or tissue entering into the composition of the organs already alluded to.

As health may be defined to be harmonious action, so disease may be said to be discordant and irregular action of the various organs of the system. In health, the different organs act in a regular and similar manner; in disease, on the contrary, they act in an irregular and dissimilar manner, some acting excessively, while others are torpid, giving rise to the loss of that due and universal excitement, which may be called the law of health or sympathy, and inducing that irregular excitement, throughout the system, which may be defined to be the law of disease or allopathy.

I shall, at present, refer to some instances which indicate the existence of this law. The skin being exposed to the influence of cold, becomes chilled;

in consequence of which, the extreme vessels become inactive and cease to act; whence results checked perspiration. Here we have diminished activity, interrupted action, and suppressed secretion of the skin. What now takes place? Diarrhœa. How is this effected? The activity of the skin being diminished, that of the mucous membrane of the stomach, bowels, &c., is increased; whence, under the usual degree of stimulation, results increased action, producing increased secretion from the mucous membrane of the stomach and bowels, liver and other abdominal viscera. The irritability of the muscular parietes of the bowels being now called into action by the presence of the secreted matter, evacuation takes place; and, thus, we have diarrhœa from checked perspiration. When the skin is exposed to great heat, its action is increased, giving rise to sweat; but if the heat be long or continually applied, it loses its irritability, and perspiration is suspended. In this case, the bowels have their irritability increased, and from slight causes, diarrhœa results. But from the same cause, the mucous membrane of the bowels may be thrown into a state of habitual hyper-action, with suppressed secretion, while the skin and muscular parietes of the intestines remain torpid. In this case a glass of very cold

water, being drunk, will produce perspiration and an alvine evacuation.

A cup of warm tea, being drunk, by gently exciting the action of the stomach, in cold weather, will give rise to increased perspiration. Sudorifics act on the same principle. Many other instances might be adduced to show that when the stomach is gently excited, the skin's action is also gently increased; but that when its irritability is reduced by the operation of cold ingesta, or from the effects of over-stimulation, that of the skin is proportionably increased and *vice versâ*.

Again, the stomach being moderately stimulated, moderately increased action of the brain is also induced; but if the irritation be carried farther, the action of the brain diminishes, and retrograde action of the stomach takes place; whence result giddiness and vomiting, or, at least, temporary inactivity of the latter organ. The capillaries of the brain now take on the vicarious action of the torpid stomach, and give rise to pain of head and disorderly action of the mind, manifested in confusion of thought, incoherent, talking, &c. At length the irritability of the capillaries of the brain is also exhausted, and, becoming passive, the blood is driven into them so abundantly as to give rise to the phenomenon of oppression of

that organ, as is manifest in the case of intoxication from the abuse of ardent spirits or fermented liquors. When the brain becomes oppressed from this cause, the skin and circulating organs take on increased action. Whence the pulse is full and strong, the breathing oppressed and stertorous, and the skin is either hot and dry or warm and moist. Things remain in this state till the stomach, gradually recovering its irritability, begins to react slowly, inducing the sympathetic action of the brain, and thus dispelling the thick clouds of intoxication. Not yet, however, is all the inconvenience of a debauch removed; for the action of the stomach being weak, the capillaries of the brain have to act more powerfully than natural, giving rise to headache. In this state it is, that, by gently stimulating the stomach, we restore the harmony of action between the brain and stomach, and remove headach.

Moderate exercise in the open air, will also, by regulating the action of the skin, sympathetically affect that of the stomach and brain.

When the extreme vessels of the stomach have, by whatever cause, been debilitated, and are loaded, being, in consequence of the loss of their irritability, unable to emulge themselves, the extreme vessels of the brain, having, at the same time, their irritability increased, act excessively, giving rise to the sensation of pain in the head.



In this case, an emetic, by stimulating the stomach, evacuates its contents, emulges its extreme vessels, and, by its general effect, restores the system to the just balance of action which was lost; and, in this manner, removes the headache and other inconveniences that may attend it.

When, in consequence of previous excessive irritation, the capillary vessels of the mucous membrane of the stomach and intestines have lost their irritability or power to contract upon their contents, and, thus, to remedy the congestion which prevails in them, the irritability of the skin is increased to such a degree, that although heat is generated in an extraordinary measure, perspiration is altogether suppressed;—in this case, the application of cold water, or any other cold substance to the surface, by abstracting caloric, (a stimulant,) reduces the action of the capillaries of the skin to a more healthy standard, giving rise to the phenomenon of increased perspiration; and, at the same time, by diminishing the irritability of the cutaneous vessels, exalts that of the capillary vessels of the mucous membrane of the intestines, enabling them to evacuate their contents, and resume their healthy action.

The application of leeches to the abdomen produces, in a similar case, similar effects; but they seem to operate by the continued stimulation of

their bites reducing the irritability of the cuticular capillaries to its due degree; and the suction of the leeches may give rise to mechanical derivation of blood from the internal towards the external surface; and, thus, directly emulge the capillaries of the abdominal mucous membrane.

Whenever, within certain moderate limits, the irritability of any part of the capillary system is diminished, its action becomes diminished; and the extreme vessels of that part are congested or infarcted. In this state, the larger arteries leading to the part affected, have their irritability and action increased, which is again aggravated by the impediment opposed to the passage of the blood, through the inactive congested capillaries. The blood is now impeded in its passage through other arterial branches; and, eventually, the heart becomes irritated, and its action is increased, by the impeded circulation of the blood. This is what constitutes general reaction.

But here we again observe the law of allopathy in operation; for when the irritability of any part of the capillary system is reduced, that of the heart and arteries leading to the affected part is increased.

Another manifestation of the operation of the same law, is, what takes place in Asiatic cholera. Here, however, the torpor or irritability and con-

gestion of the capillary and venous systems is so universal, that the heart and arteries, although possessing increased irritability, cannot manifest it, by taking an increased action; because they are deprived of their accustomed stimulation, the blood collecting in the capillaries of the mucous membrane, and in those of the nervous and glandular systems generally.

The correctness, I repeat, of this observation seems to me, to be pointed out by the effects attributed to the injection of saline solutions into the large veins, during the state of extreme collapse, which takes place in the graver cases of this disease.

Were I so inclined, I might write a treatise in elucidation of the principles here alluded to; but I must content myself with noticing a few facts which may be referred to them.

The kidneys are very active when the digestive organs and skin are inactive and debilitated; which takes place in certain forms of dyspepsia.

The mucous surface of the bowels being over-excited, the muscular coat is inactive; which occasionally takes place after taking a drastic purge. Here no evacuation or inclination to go to stool occurs. The action of the extreme vessels of the skin and assimilating organs is diminished, when that of the extreme vessels or contractile fibres of

the nervous system is unnaturally increased. This is observed in certain nervous complaints.

I shall, probably, have occasion again to refer more particularly to the operation of these principles, when I come to dwell on the treatment of Fever.

## CHAPTER V.

## OF THE DIAGNOSIS OF FEVER.

DIAGNOSIS means distinction or discernment, being derived from the Greek word *διάγινωσκω*, I know perfectly, discern, or distinguish. It may be applied to the power or faculty of judging or distinguishing between any two things in nature; but as regards fevers, it is the judgment which is formed respecting their natures; so that, one individual fever is referred to one class, and another to another.

The following may be given as instances of logical distinction, which holds good in every case in which a judgment is formed. Only quadrupeds have four feet; this animal has four feet—we have

only, as yet, made a comparison ; now comes the decision or distinction—this animal, because he has four feet, is a quadruped. Again, no effect is without a cause ; something is without a cause ; therefore that thing is not an effect. Further, a bilious fever only is attended with increased secretion of bile ; this fever is so attended ; therefore this fever is a bilious one. Diarrhœa may depend on various causes ; this is a diarrhœa ; therefore it may depend on a variety of causes. But a certain cause especially operates in this instance ; therefore it depends especially on that cause. Certain symptoms may depend on different affections ; these symptoms exist in this case ; therefore they may depend on different affections, as no particular affection appears here ; consequently, no diagnosis can, in this instance, with certainty be made. These are instances of the mental processes which invariably takes place previous to a reasonable diagnosis being formed, with respect to any case of fever ; although, perhaps, the observer may not be at the time conscious of what is passing in his mind, in consequence of long habit, and the rapidity with which its operations are conducted.

Diagnosis, therefore, as applied to fever, is the distinguishing one form of fever from another, or from any other disease ; and it is based on the discrimination by the mind, through the medium of



the senses, of the morbid states of the organs, on which each individual fever or form of fever depends ; since it has been shown, that all fevers depend on derangement of some organ or organs.

In order, more conveniently, to consider this subject, I shall take a rapid glance at the different forms of fever which occur in practice, referring their particular or pathognomonic symptoms to the derangement of the organ or organs on which they depend. This I purpose doing under the following heads:—1st, Nervous Fever ; 2nd, Gastric or Abdominal Fever ; 3rd, Pulmonary Fever ; 4th, Inflammatory Fever ; 5th, Rheumatic Fever ; 6th, Glandular or Muco-Glandular Fever ; 7th, Cutaneous Fever. This done, I shall either immediately or as a supplement to this treatise, enter into the consideration of Typhus and Yellow-fever, Plague, and Cholera, these being instances of the most complicated forms of fever that have ever yet afflicted man.

1st. Nervous Fever.—In its purest form it begins with confusion of intellect, pain of head, chills, and shivering, succeeded by general restlessness and uneasiness ; pain and uneasiness of the back, loins and lower extremities ; great sensibility to light, sound ; and to impressions from other external agents. So that the patient lies with his eyes closed, and starts at the least noise.

The senses generally are painfully affected by the slightest impressions from external objects. The pulse is accelerated but not increased in force ; it is, on the contrary, generally weak and tremulous. The functions of the skin are not much altered, and though sensations of heat and cold irregularly succeed each other, the natural temperature of the surface is not much augmented. It is sometimes, however, cooler than natural ; and this alternates with sudden increase of temperature. The tongue is usually whitish, moist, and tremulous ; the bowels confined ; and the urine either slightly diminished or nearly natural. As the disease advances, the pain of the head and back increases ; and delirium, tinnitus aurium, cophosis, syncope, low muttering—delirium, picking of the bed-clothes, and convulsions, succeed each other.

These are the symptoms which characterize this disease ; and they are all referrible to increased or diminished action of some part of the brain and spinal marrow, or of their investing membranes. Though these symptoms occur in other fevers, still they are not characteristic of them ; and they are to be regarded only as complications of them, with the affections constituting nervous fever ; much in the same way as abdominal fever occurs, complicated with the affections constituting nervous fever, in the form of typhus gravior. When the fever is

unattended with reaction, and, in consequence, the nervous system is much oppressed, it takes the name of low nervous fever, or, as some have called it, typhus mitior. Nervous fever is usually continued, though it may be occasionally remittent and intermittent. It may be confounded, and usually is, with abdominal fever in certain stages. We must, however, always refer to the history of its rise, and look to the causes by which it has been induced, and to the temperament of the patient.

2. Gastric or Abdominal Fever.—The symptoms characteristic of this complaint are dependent on disorder of the stomach and bowels, and of the other chylopoietic viscera. These are constipation or looseness; vomiting, sickness of stomach; thirst, loss of appetite; white or yellow-coated tongue; dryness of mouth; heat and tension of belly; changes in the quantity and quality of the urine; suppressed or increased secretion of bile or mucus; sometimes pain on pressure of different parts of the abdomen, &c. Though the nervous and muscular systems (which include the heart, arteries, and capillary vessels) may occasionally suffer, as well as the respiratory organs, still any symptoms resulting from more than ordinary sympathetic or allopathic affection of them, are not essential to the constitution of this fever. Accordingly, the respiration may be hurried, the pulse slow or accele-

rated, without much variation of force. The skin may be hotter or cooler than natural. Perspiration may be suppressed or increased—it may be partial or general, warm or cold. There may be slight pain of head; but should delirium and other nervous symptoms make their appearance; in fact, should symptoms of a different or more severe nature than those enumerated, supervene, then the disease must be regarded as a complicated one. When the stomach is most affected it is called the gastric fever; when the liver is principally disordered, it takes the name of bilious or hepatic fever. Should the secretion of mucus be much augmented, it is then denominated mucous fever.

Although this disease is usually of the remittent condition, still it may exist under the continued, intermittent—irritative or hectic form. In this last condition it has been confounded with nervous intermittent fever. Yellowness of conjunctiva, and of the renal, salivary, and cutaneous secretions, is peculiarly characteristic of that variety of abdominal fever called Hepatic or Bilious, attended with increased secretion of bile; but which, from torpor or obstruction of the common biliary duct, not finding an immediate vent into the duodenum, becomes absorbed into the general mass of circulating fluids, giving rise to the peculiar symptoms in question.

3. Pulmonary Fever.—This disease is distin-

guished by peculiar symptoms, depending on disorder of the pulmonary organs, as accelerated, oppressed, difficult or painful respiration ; cough, with or without expectoration ; accelerated, or oppressed (sometimes strong and hard, and sometimes the reverse) pulse. These symptoms, occurring together with the usual phenomena of fever, are quite sufficient to mark the complaint. But should other symptoms, not referrible to the usual sympathetic or allopathic disorder of other organs, supervene, the disease must then be regarded as an instance of complicated or mixed fever.

We may distinguish here between pleuritic fever, characterized by difficult, painful respiration, with strong hard pulse, and catarrhal-fever, in which these symptoms are absent. Catarrhal fever is, on the contrary, attended with humid and dry cough, and usually, with accelerated, weak, or oppressed pulse. The skin is hot and dry. These disorders may be either continued, remittent, intermittent, or hectic. This is determined by their intensity, which, in its turn, is influenced by the original constitution of the patient, and his acquired habit of body, together with the nature of the predisposing and exciting causes, whether they be depressing or exalting ; of sudden, continued or interrupted application.

4. Inflammatory Fever.—This fever is charac-

terized by the symptoms of what is called constitutional reaction. It depends on irritation of the mucous membrane of the heart, arteries, and capillary vessels. The symptoms are as follow :—After slight chills and slight symptoms of collapse, accelerated, strong, hard pulse; accelerated respiration; heat and dryness of skin; headache; thirst; white tongue; redness of face, eyes, and surface generally; some pain or uneasiness in the back, loins and lower extremities; generally costiveness and diminished high-coloured urine. If the symptoms of disorder of the nervous system, and of the respiratory, and abdominal organs, go farther than this, we must regard the fever as complicated. This fever is generally continued, or slightly remittent. It is most generally excited in strong plethoric young subjects of the male sex, possessing a sanguine temperament; although a sanguine temperament, and a plethoric state of the system, at any age, and in either sex, predispose to its development. Checked perspiration, or any suddenly suppressed secretion, is the usual exciting cause, although any unusual stimulus suddenly operating on a system predisposed to inflammatory action, such as the use or abuse of stimulating food or liquors, violent passions of the mind, &c., will be productive of this complaint.

5. Rheumatic Fever.—This disorder declares it-



self as follows,—Lassitude and rigors, succeeded by heat, thirst, anxiety, restlessness and hard pulse; soon after which, excruciating pains are felt in different parts of the body; but, more particularly, in the large joints, and these keep shifting continually from one joint or part of the body to another. The pains are more severe during the night, and their shifting from one part of the body to another is characteristic of this disease. This fever is commonly of the remittent condition. It is found to affect persons subject to rheumatism, or those who are of a rheumatic diathesis. Should other symptoms be present, they are to be referred to the head of complications. Suppressed secretions, or any sudden impressions, whether mental or mechanical, occurring in a rheumatic diathesis, are the ordinary causes of this fever.

Glandular, or Muco-Glandular Fever.—This disease might have been included under the head of abdominal fever, as the mesenteric glands are those which are most frequently affected; but having observed that the glands in different parts of the body are occasionally simultaneously affected, I have thought it more in accordance with the principles of strict analogy, to consider this disease as depending, for its characteristic symptoms, on irritation, and its consequences, of the glandular and absorbent systems generally. Accordingly, after the preva-

lence, for more or less time, of febrile symptoms marked with slight reaction of the general system, the glands in different parts of the body, more particularly the lymphatic glands, such as those in the neck and groin, those in the course of the absorbent vessels of the lower extremities, those in the axilla, &c., will be found to be painful, hard and tense. In fevers attended with the above symptoms, and in those also wherein external glandular swellings and pains have not been manifested during life, but which have terminated fatally, I have frequently discovered the mesenteric glands very much enlarged; whilst the mucous membrane of the small intestines has been found much injected. The diagnostic symptoms of this fever, therefore, are pain and swelling in the course of the absorbent vessels and lymphatic glands, succeeding to slight febrile symptoms, unattended with very marked derangement of the nervous system, stomach, bowels, and circulating organs. That variety of the disease which depends on irritation of the mesenteric glands and abdominal absorbents, though it may be suspected to exist during life, from the tumor and heat of the belly, unattended with any very remarkable derangement of the bowels, and from the general character of the fever; yet it cannot be certainly known, till dissection reveals the secret.

This disease is generally of the remitting condi-

tion, although sometimes it intermits. But certain circumstances of original temperament and acquired habit of body, inducing plethora or debility, may determine it to assume either the continued or hectic condition or form. When continued, it is generally complicated with irritation of the heart, arteries, &c. In weak emaciated subjects it presents itself under the form of hectic fever.

The disease known by the popular name of Decline is an instance of this latter affection. That denominated Infantile Remittent is an instance of its complication with irritation of the mucous membrane of the bowels.

7. Erysipelatous, or Cutaneous Fever. After well-marked symptoms of fever for more or less time, the external surface being sometimes hot and dry, sometimes cool and moist, the countenance occasionally red and excited, or pale or sunken, there appear various eruptions on the surface of the body. Such as, Papillæ (pimples) or small acuminate elevations of the cuticle with inflamed bases, very seldom containing a fluid or suppurating, commonly terminating in scurf; Exanthemata (rashes) or superficial red patches, variously figured and diffused irregularly over the body, leaving interstices of a natural colour, and terminating in cutaneous exfoliations; Bullæ (blebs) or large portions of the cuticle, detached by a transparent watery fluid;

Pustulæ (pustules) or elevations of the cuticle with an inflamed base, containing pus ; Vesiculæ (vesicles) or small orbicular elevations of the cuticle, containing lymph, which is sometimes clear and colourless, but often opaque and whitish, or pearl-coloured ; tuberculæ (tubercles) or small hard tumours, circumscribed and permanent, or suppurating partially ; Maculæ (spots) or permanent discolorations of some portion of the skin, with a change of its texture ; wheals or rounded or longitudinal elevations of the cuticle with white summits, but not permanent, and not containing fluid or tending to suppuration ; Stigmata, or minute red specks on the skin, without any elevation of the cuticle—when stigmata coalesce and assume a dark red or livid colour, they are called petechiæ.

These different eruptions are all results of irritation of the skin, and though they are so diversified, still we cannot be surprised at the fact, when we consider that the skin (which is a very complicated structure) has its blood vessels, its nerves, its absorbents, and varied secreting apparatus, each of which organs may be more particularly the seat of disorder. Though the skin, from its exposure to the influence of various mechanical and chemical stimulants, and to that of cold or moisture, is frequently the seat of primary irritation, yet it is generally influenced allopathically, or sympathetically,

by disorder of the internal mucous surfaces; and *vice versâ*, the mucous membranes are, in the same manner, affected by derangements of the skin. It is for this reason, that we find fevers of this class, frequently attended with disorder of the abdominal and pulmonary organs. These disorders may be, like other diseases, complicated with affections of organs, which give rise to symptoms not essential to them as cutaneous fevers. I shall mention here, several varieties of cutaneous fever, but must refrain from dwelling on their particular symptoms and histories, as this would be exceeding the limits which I have prescribed to myself. To this category, then, belong variola, or small-pox; rubeola, or measles; scarlatina, or scarlet fever; urticaria, or nettle rash; roseola, erythema, or erysipelas; varicella, or chicken-pox; miliaria, or miliary fever.

Now although some of these names have been given by authors to diseases supposed to be independent of fever; and although they generally, if not always, depend on a morbid condition of the blood; yet I think they can, with great propriety, be considered to be fevers depending on irritation determined to the different structures of the skin; and that, by the morbid condition of the blood, which is the *primum mobile* of the entire phenomena, as well febrile as eruptive. But these eruptions, which have been noticed as characteristic of cutaneous fevers, are

only so, when they make their appearance after a well marked train of febrile symptoms, for they frequently occur as consequences of other disorders ; but even in this case, they are the result of a certain degree of irritation of the skin, whether sympathetically or allopathically induced.

This concludes what I have to say on the subject of diagnosis.



## CHAPTER VI.

## OF THE PROGNOSIS OF FEVER.

THE word prognosis means foreknowledge, foresight, or pre-judgment. It is derived from the Greek word *προγινωσκω*, I know beforehand, or I prejudge. And it may apply to the faculty of discerning, foreknowing, or prejudging the result of any passing event or events. As regards fever, however, it is the judgment which is formed concerning their terminations whether in health, death, or some other disease.

This is a most noble faculty, full of advantage both to the patient and to the physician, and it is that which pre-eminently distinguishes the philosopher from the simpleton. By it, the patient is

made aware of his danger, and is induced to adopt the means necessary for averting impending evils ; at least, he is prepared to encounter them with a proper spirit ; or, at all events, he is relieved from groundless disquietudes. The physician, on the other hand, is enabled to foresee the natural tendencies of disease, and to employ the proper remedies for counteracting them. But even in the event of failing to accomplish his purpose, he is not surprised himself, nor does he mislead the patient and his friends, by flattering them with a vain hope of recovery. Thus is the patient led rightly to estimate his present condition and future prospects ; and the physician, whatever be the result of the case, maintains his credit for knowledge and foresight in the minds of the community—than which, as regards their health, and his success, nothing can be of greater importance.

Every rational prognosis, however, must be founded on knowledge of the organs principally affected in fever, whether it is essential or not to the continuance of life ; whether it is likely, by its connexion with other organs, more important than itself, or at least equally so, to involve them in a similar affection with that which it suffers ; and of what nature the affection is.

Hence it is evident that the prognosis is always unfavourable in fevers depending on irritation, and

its consequences ; of the brain and nervous system ; of the heart, and vascular system ; of the lungs and bronchial tubes ; and of the stomach and bowels, particularly in a bad habit of body, however induced, and in an uneasy state of the patient's mind. This accounts for the fatal nature of epidemic yellow fever, typhus, fever, plague, cholera, and seascurvy, together with certain forms of epidemic catarrhal fevers, commonly called influenzas, forms of epidemic abdominal fevers, known by the name of malignant dysenteries, epidemic pleuritic fevers, called malignant or false pleurisies, not to omit innumerable forms of epidemic fevers, subject to the remittent and intermittent conditions, which have been recorded by medical writers of the greatest respectability in every enlightened country. Epidemic fevers, depending, also, on irritation of the muscles and of the skin, (by reason of the close connexion of these organs with the heart and arteries, and with the stomach and bowels, and through them, with the nervous and respiratory systems,) prove occasionally very fatal. Of this class are epidemic rheumatic fevers, called acute rheumatisms, which destroy life by involving the heart in the disease, and epidemic cutaneous fevers, as measles, scarlatina, &c, which kill by involving the lungs and the brain in the morbid affection.

Besides the unfavourableness of the prognosis in

all fevers depending on irritation of any of the vital organs, in a bad habit of body, or of those in close connexion with them ; it can never be altogether favourable in fevers, depending on irritation established in any of those organs, particularly if the patient be plethoric, or his mind be in a disturbed state ; for in the case of plethora, the irritation is apt to run into inflammation and consequent disorganization of the seat of the disease ; and in that of a disturbed mind the brain is generally involved, which soon puts an end to the patient's existence.

On the other hand, the conditions which lead to a favourable prognosis in fevers, are the unimportance of the organ, which is the seat of the disease, to the continuance of life ; a good habit of body ; moderate development of the system ; an easy mind. When all these conditions concur in the same individual there may be said to be absolutely no danger. But even when any of them takes place, it goes far to diminish the unfavourableness of the prognosis. Thus, should the mind be easy, even if the other unfavourable conditions be present, there is a great hope that the patient will eventually recover ; and *vice versâ*, should the mind be very disquieted, the other conditions being the most favourable, there is great room to fear the case will terminate unfavourably.

On the whole, then, we conclude, that the con-

ditions which lead to a favourable prognosis in fevers, whether sporadic or epidemic, are the unimportance of the organ (the disorder of which is the immediate cause of the disease) to the continuance of life; a good habit of body; moderate development of the system; and an easy state of the mind; and that the more these conditions predominate, the greater is the prospect of the patient's recovery. But, on the other hand, in fever, whether sporadic or epidemic, the indications of an unfavourable termination, are the importance of the organ, the affection of which is the immediate cause of the disease, to the continuance of life, a bad habit of body, however induced; plethora; and an uneasy state of the mind.

I cannot do better than conclude this subject by quoting what Nicholas Robinson (whose theory of physic and diseases was founded on the principles of the Newtonian philosophy, and who wrote more than a hundred and twenty years ago,) says respecting prognostic signs, inasmuch as it is remarkable, and ought to be impressed on the minds of every practitioner of medicine. "The prognostics of diseases, therefore, are to be taken from the intenseness of the disease, the force of the symptoms, and the greater or lesser impressions they make upon the constitution of the patient."

"To estimate the intenseness of any disease,

there is to be considered, first, the parts affected, always the more noble, the more dangerous. Secondly, the degrees of pain, and the suddenness of its invasion ; for all diseases are more or less acute, as they more or less suddenly invade the patient ; and as the parts where they are seated are more or less nervose, and as the organs of those nervose parts are more or less distracted with their fluids. Thirdly, the effects of the symptoms, viz. what danger accrues to the parts ; and in this case, the height of the disease is narrowly to be inspected.

“ In this most absolutely necessary branch of physic, was the divine Hippocrates superior to all that went before or succeeded him, for he could not only determine the issues of life and death, from the different nature of the symptoms, to a very great certainty, but also, from the different dispositions of the seasons, could foretel the peculiar diseases that were about to be epidemical, as he did that raging plague of Athens, to the wonder and surprise of all the world ; which remarkable prognosis gained him a name great and reverend through all antiquity.”

“ The pulse being the grand card or compass by which the physician steers his course, both in estimating the diagnostic part, which comprehends the intenseness of a disease, and the prognostic, which, with all its concurring symptoms, discovers the

danger consequent thereon ; I think it will not be foreign to my purpose if, before I enter upon the subject of diseases in particular, I first inquire into the nature and cause of its beating, and the several variations it makes in most diseases, when it rises or falls above or beneath its natural standard.

“ The cause of all pulsation is the beating of the heart, and contraction of the artery adjoining thereto, which communicates a vibrating motion to every fibre in the body ; and this impulse of the solids is the spring that supports the motion of the fluids in every part.

“ From the beating of the pulse, we draw several certain conclusions, especially in acute diseases ; for from the elevation or depression of the pulse we judge the impulse of the heart to be stronger or weaker, the contraction of the solids to be greater or lesser, and, of consequence, the motion of the fluids to be swifter or slower.

“ The several degrees of cohesion of the fluids are discovered from the different motions of the solids, and we demonstrate the different motions of the solids from the variation of the pulse.

“ Whatsoever, therefore, will raise the beating of the pulse, when depressed beneath its natural standard, will raise the contraction of the arteries, will proportionally increase the motion of the fluids, and, of consequence, will contribute very



much in bringing the fluids, destined for nutrition, within the sphere of contact, by destroying their cohesions, and breaking, dividing, and attenuating their viscidities, whereby they penetrate the minutest artery.

“ Besides the quicker motion of the fluids, the oftener are they brought to the test of the strainers, the sooner will they depurate and refine ; all which effects are discovered by the beating of the pulse, and have their whole dependence upon the vigour, activeness, and springiness of the solids.

“ When a physician, therefore, visits his patient, before he makes any inquiries into the nature of the disease, the state of the patient, pressure of the symptoms, or prescribes any medicine for the relief of this malady, his business is, in the first place, to feel the pulse, and to determine the conduct of his future directions, according as he finds that to vary from its natural beating.

“ It is true the pulse cannot inform us of the particular nature of the disease, more than inspecting the urine, yet are both necessary in discovering the intenseness of the disease, and making a sure prognosis of danger or safety.

“ We discover the particular species of the disease, by knowing the parts affected, or by knowing the intemperature that discomposes the structure of the parts ; and as that intemperature must arise from

the information of the solids, elevated or depressed above or beneath the balance of nature, which constitutes the essence of all diseases, both acute and chronic, so the particular species, as we have already observed, must be determined from the parts affected, and the degrees of its intenseness from the variations of the pulse. The right knowledge of the pulse then, being of such extraordinary service, we shall here inquire into its nature, degrees, and variations, and the diagnostics and prognostics we ought to make from the difference of its beating; and, though authors make a vast many distinctions and sub-divisions of the pulse, more, I am sure, than the most skilful physician can distinguish from the application of his finger to the wrist; yet I shall only take notice of four variations it makes in diseases, when it starts in its beating from the standard of nature, viz., as it is higher or lower, quicker or slower.

A high pulse, that is quick in its beating, indicates acute continual fevers, and generally attends the paroxysms of chronic diseases, where the intenseness of the pain is apt to create a fever; for the solids, in their contractions, while the body labours under the paroxysms of chronic diseases, are always elevated above their natural balance, which elevation they suffer from the endeavours of nature to remove the cause of the paroxysm.

“A quick pulse, if it be a low pulse, is ever a weak pulse, which most commonly attends malignant fevers, and arises from obstructions of the brain, whereby the animal spirits cannot be detached in quantities sufficient to influence the heart. Hence spring all those stupors and disorders of the brain that generally under these circumstances prove fatal to the patient.

“On the contrary, a high pulse, if it be a strong pulse, for the most part indicates a hard pulse; and this elevation of the solids generally is attended with inflammatory fevers, as the pleurisy, peripneumony, quinsy, acute rheumatism; all which diseases proceed from a fulness of the vessels, which keep the arteries tense, and, as it were, distracted with their fluids.

“In all pains that affect the nervous parts, and therefore are greatly acute, the pulse differs little from what it beats, while the body labours under acute inflammatory fevers, as in the more severe pains of the gout, stone, &c.

“Chronic diseases, such as arise from an over-relaxed state of the solids, whereupon the viscidities of the fluids are greatly increased, have always for their concomitant a slow, weak pulse, languid, though equal, but yet stronger than that which attends malignant fevers. This generally accompanies the scurvy, the hypochondria, melancholy, jaundice, and

all those of a cachectic habit of body ; and if the pulse under these circumstances vary a little quicker, there is danger of wastes, decays, and consumptions.

“Lastly, in the beating of all pulses, a due regard must ever be paid to the constitution of all bodies, and their different temperaments ; for it may be generally observed, that those persons of an active, brisk disposition, have naturally a quick, unequal pulse, which, upon any sudden surprise, is apt to flutter ; when, on the contrary, the pulse of one naturally of a listless, inactive disposition, beats with a heavy pace, and, as it were, founders along. Yet, at last, I must confess, such is the variety of pulses in healthful dispositions, that no clear indications can be taken entirely to depend upon, whereby the physician may find a certain prognosis of the issues of life or death ; for in some cases, especially malignant fevers, we have observed the patient recover, when all the symptoms of the pulse have absolutely determined a fatal prognosis.”

Under the head of Prognostics, the same writer goes on to remark, “ Seeing the ancients paid such reverence to the urinal as in most diseases to prognosticate something from its inspection, it would be unpardonable in me to pass it over without some particular remarks. If we consider the nature of this fluid, and the manner of its secretion, we

shall be able, in many great and dangerous diseases, not only to discover the intenseness of the symptoms, but also to make some considerable prognostics in determining the danger or safety that may be expected from the issues of the disease.

“ Indeed, the misfortune is, that this practice of discerning diseases, and prognosticating their danger from the nature and difference of urines, has been prostituted to such vile ends, as to bring it into the general contempt of those that ought to know better, than to lay aside any useful knowledge, because it may, or has been prostituted to base ends.

“ I shall, therefore, for the benefit of those that retain any regard for the judgment to be made upon urine in diseases, lay down instructions for knowing the indications that may or may not, upon just observations, be deduced from this way of practice ; for so intricate are the progress and scenes of some diseases, that they require all the little aids and helps we can, by any means, obtain, for clearing up the difficulties that attend their cure.

“ Indeed, I may not deny, but there is a statute I have read, which obliges the several physicians, members of the present college here in London, not to give judgment upon urine, unless called to visit the patient, and present to judge of all other concurring symptoms, which being duly weighed

together, contribute not a little in determining with some certainty what will be best for the relief of the patient.

“ ‘Statuimus et ordinamus ut nemo, sive socius sive candidatus, sive permissus, consilii quidquam impertiat veteratoriis et impostoribus super urinarum nudâ inspectione, nisi simul ad ægrum vocetur, ut ibidem pro re natâ idonea medicamenta ab honesto aliquo pharmacopolo compomenda præscribat.’

“The urine, we all know, is a fluid separated from the blood, and secreted by the kidneys; and as the contraction of the emulgent arteries are elevated or depressed above or beneath the balance of nature, so is the texture of the renal glands more or less springy, so is the urine more or less grossly secreted; which different manner of secretion either renders it limpid, clear, and watery, as generally attends the beginning of acute diseases, or crowds it with a gross muddy, turbid sediment, as always appears to affect the urinal under chronic indispositions.

“We observe in acute diseases attended with highly dangerous symptoms, such as the pleurisy, peripneumony, and the burning causus, that the urine, in the beginning, is very clear, and but little in quantity; which proceeds from the vibrations of the arteries being so highly elevated above their natural poise, as almost to convulse the springy orifices of the glands, upon which nothing but the clearest



and thinnest parts of the blood can make their way through those minute passages. And that intense heat and dryness of the habit, which always attend the extremest acute diseases, proceed generally from an over-violent contraction of the cutaneous glands, which both indicate the severity of the impending symptoms, and give us a prognosis, fatal enough, of what may be expected from the event of the disease.

“It is a general observation, when with exercise we are very hot, or much fatigued with walking, that a glass of cold water shall, instead of allaying, increase the cuticular discharges, whilst that a dram of some rich and generous cordial shall restore the springiness of the glands, contract the sweats, and raise the vigour of the solids. This we observe daily to happen; and there is scarce an old woman, but what can tell it you without the assistance of her physician.

“On the contrary, when the arteries are too much relaxed, as always happens under chronic diseases, from the contractions being depressed beneath their natural standard, the secretion of the urine will be grosser; for the glands of the kidneys being more languid in their springs, will not be able to prevent such cohesions in the fluids as will afford a sediment of different kinds, according to the different



nature of the disease, abating for the differences of constitution, manner of living, &c.

“The jaundice most commonly produces a bitter urine, and which will tinge anything dipped in it of a pale green or dark yellow.

“A diabetes manifests itself evidently from the taste of the urine, which always abounds with saccharine salts, that give it a sweet savour, and which proceeds from an universal decay of the contractile powers of the solids.

“An insipid urine, or tasteless, is a very dangerous symptom, and always indicates that the natural digestions of the viscera are highly vitiated.

“Decays, wastes, and consumptions are discovered from the urine’s abounding with thin skins and a mucous substance, that separate from the bladder, as it suffers in the general decay with the other parts. Sometimes, when this bowel is primarily affected with an ulcer, sloughs will come away with the urine, which, when it settles, appears to contain a white gritty sediment, as commonly attends those that are highly scorbutic.

“Thus far it evidently appears that there are some diseases that may certainly be known from the quantities and qualities of the urine, and others that naturally result from its contents, on the separations it affords, after it has stood a little; as gravel settling to the sides or bottom of the urinal plainly

indicates the constitution inclinable to a calculous disposition or some chronic disease.

“A plentiful discharge of urine, therefore, is a favourable prognosis under all diseases except diabetes; for it argues the solution of the disease, especially if it be acute, and a plentiful sediment crowd the urinal, and that the solids are retreating within the balance of nature. Hippocrates himself makes it a laudable prognosis, in vomitings, in fluxes, and in fevers, especially the nervose. Indeed, in these latter cases of fevers, it sometimes supplies the discharge wanted, and which cannot favourably be procured by the cutaneous emunctories.

“On the other hand, its suppression or partial evacuation, that is when it is in lesser quantities than the natural secretions require it should be, often is a fatal omen, and argues that the disease, if acute, is not at its height; and in the fits of chronic diseases, indicates that the paroxysm will be of long continuance, as often happens in the gout, stone, or asthma.

“Those medicines that go under the name and title of diuretics, and therefore are supposed to obtain great influence in forcing this discharge, are the most precarious class of medicines in the republic of physic, nor can safely be depended upon in any disease attended with imminent danger; for,

instead of increasing, they often suppress this evacuation ; and those that are the strongest, often give us the least quantities of urine, because their stimulating powers too much restore the springiness of the secretory glands, which straighten their passages and occasion those stranguries and pains that most complain of, upon taking a large dose of the stronger diuretics."

This must terminate what I have to say under the head of prognosis.

## CHAPTER VII.

## OF THE RESULTS OF FEVER.

To those who have followed me in the reasonings and investigations which appear in the foregoing chapters, it will be evident that the essential nature of fever is irritation—existing in excess in some organs, and deficient in others, composing the system, together with the train of sympathetic and allopathic actions which result from it, of which the object is the restoration of the balance of irritation, (which word includes, as I believe I have already hinted, both the operation of a stimulant and the reaction of the organ which is the subject of it,) which had been disturbed, to the system in general. This, I say, constitutes the essential nature of fever.

This is what Stahl meant by the efforts of the vital principle to eliminate, from the body, some offending matter. This was the cause of the phenomena which Boerhaave believed to constitute the essence of fever, viz. shivering, increased heat, and accelerated pulse. This was what Cullen meant by the spasm of the extreme vessels, and the operation of the *vis medicatrix natura*. This was what Pinel implied, when he considered fever to depend on the affection of certain organs or of their secretions. This also was what Broussais intended to signify (as I understand him) when he determined fever to be the result of certain organic affections awakening certain sympathetic actions inherent in the human body. And this, I think, is the natural result of the painful but faithful investigations of physiologists, who have devoted their lives to the discovery of the properties of the living body.

The phenomena of fever, then, depending on the disturbance of the balance of irritation in the system, and the combined efforts of its different organs to restore that balance, it naturally follows that when it is restored, the fever will cease. This will also be the result if, by any means, the combined efforts of the system should cease, and the irritation fix itself immoveably in any given organ. A similar result will take place if the powers of the system, by whatever means, should fail, being exhausted by the

violent commotion which takes place in this disease, and which is the pathognomonic sign of simple fever.

Accordingly, the results of fever (to enumerate them in the most favourable order) are, resolution, inflammation, and death. Under these three heads, may be included every variety of febrile termination that can possibly occur, if we exclude a resurrection from being one of the results of fever.

Resolution is known to have taken place, when all the general symptoms of fever, such as shivering, increased heat, accelerated pulse, together with the peculiar symptoms of any particular form of it, (as disturbance of the intellectual faculties in brain fever, or disorder of the functions of the liver in bilious fever,) cease, and all the natural actions, secretions, and evacuations, return to their accustomed standard. To secure this result, is the invariable object of the true and enlightened physician; and it is frequently that which is best secured by abstaining from any officious interference with the salutary operations of nature, which implies faith (in the salutary tendency of nature) and patience, on the part of both the patient and the medical attendant.

Inflammation is known to take place, when the general symptoms of fever, in a great measure, give place to fixed pain or uneasiness in any given organ, or in one with which it is intimately associated, to-

gether with symptoms depending on the suspension of the healthy function of that organ, as pain in the region of the liver, accompanied with pain or uneasiness on the top of the right shoulder, together with a suppression of bile, in hepatitis; or pain in the epigastrium, attended with vomiting and pain in the head, and disorder of the intellectual faculties, in gastritis.

Death is a negative state, and is known to have taken place, when all the vital and natural functions have ceased, such as sensation and motion, respiration, circulation, secretion, and excretion. In reference to this subject, I shall take this opportunity of quoting what Hippocrates (according to my translation of the aphorisms) says, in his last aphorism. “But the boundary of death is, [i. e. death has commenced,] if the heat of life [i. e. the vital or animal heat] has ascended, above the navel, to the place upwards of the diaphragm [i. e. to the place above the diaphragm] or the chest, and all the [natural] moisture is consumed. After that the lung [i. e. the lungs] and the heart dismiss the moisture, [which is natural to them,] the heat collecting [i. e. being collected] in the mortal [i. e. vital] parts, the spirit of the heat, [i. e. the soul,] whereby the whole [system] consisted entire, suddenly exhales. Again the life, [i. e. the principle of life, or the soul,] whence we say to live, [i. e. to which reference is



made when we make use of the verb to live,] having relinquished the tabernacle of the body, partly, indeed, by the breathing places [i. e. the pores] of the flesh, [i. e. the skin,] but partly by the breathing places of the head, [i. e. the nostrils and mouth,] has [at length] delivered up [to corruption] the cold and mortal statue, together with the bile, and the blood, and the phlegm, and the flesh."

Death, however, is the immediate result of inflammation, of any of the vital organs, ending in mortification, and consequent abolition of the function of that organ; or it may result from anything which permanently suspends the action of such organ, as is the case in death occurring from syncope or asphyxia, in the familiar instances of fainting from loss of blood, or excessive evacuations of other fluids, and suffocation, arising from the accumulation of mucus, pus, or serum in the chest, during the latter stages of catarrhal and pleuritic fevers. Death may therefore begin in the heart, brain, lungs, or stomach, and thence be propagated throughout the system

I cannot do better than close this subject by transcribing certain observations of Nicholas Robinson, (already referred to,) under the head of "Inflammatory Fevers, especially the Pleurisy, Peripneumony, and Quinsy." He says, "We have observed, in some former discourses, that there must

be a disposition to, before there can be a generation of, a disease; and this holds good in all that variety of diseases that invade our constitutions, and this disposition of body favouring diseases is that intemperature or weakness of any particular part, whereby it yields to the disease incident to that part, for while every part makes equal resistance to the invasion of the causes, every part will equally repel the causes, and consequently every part will equally remain under a sound state of health.

“In all inflammatory fevers, therefore, it is evident the *inflammation, for the most part, follows the fever*, and is the consequence of the blood’s dividing faster than it can be discharged by the cutaneous emunctories.

“Now, so long as the capillary arteries can widen their diameters to receive the blood, and give it a passage, so long can no inflammatory fever arise in the body. The over-great divisions of the blood, in this case, will only cause a simple continual fever; but if, by the over-great divisions the blood suffers in such cases, it should obstruct in any part, that obstruction will cause a stagnation of the fluids in the vessels where it happens, which, if not immediately dispersed, will excite an inflammation, receiving the denomination of this or that disease, according to the part wherein it is lodged.

“If the obstruction falls upon the pleura, inter-

costal muscles, or diaphragm, it assumes the name of a pleurisy, if upon the membranes of the lungs, a peripneumony, though, by several authors of good credit, both these diseases are expressed by one compound term, viz. pleuro-peripneumonia, or a pleuripneumony, which signifies an inflammation of the lungs and foresaid parts jointly. If it assault the muscles of the tonsils and larynx, it is called a quinsy. Sometimes it ascends the face, and bloats it up near the eyes with a painful swelling, inflammation, and great redness, and then it is called a St. Anthony's fire: when it attacks the nervous membranes in the sensible parts of the arms, shoulders, legs, or joints, then it excites rheumatisms. Sometimes it falls on the liver, spleen, stomach, and sweetbread, and excites inflammations of those bowels, still varying its name according to the different part it is seated in.

“But as pleurisy or pleuripneumony is the most dangerous as well as tormenting, so I shall fix upon it for the basis of this discourse, and shall only touch on the others occasionally, as they occur in my way.

“They that are of a sanguine or hot, bilious constitution, are most liable to be infested with inflammatory diseases; and though neither age, sex, nor constitution are entirely free from their tyranny, yet they, most of all, invade people of the age of

one-and-twenty ; for between seventeen and thirty is the boundary of time that most suffer under them. Sydenham thinks the spring the time when they are most epidemical, for then the *blood* receives the greatest *change*, though I have known them very frequent in winter, especially the pleurisy.

“ Their manner of invasion is much the same as in acute-continual fevers, save that in the pleurisy, immediately after the invasion of that intense heat that follows the chillness, there succeeds a most sharp, pungent pain in the breast, which greatly hinders respiration.

“ The pain in a pleurisy is generally more torturing, being pungent, and as it were pricking with needles. The breathing under a peripneumony is more disturbing, but the pain less acute. A cough and headache are inseparable symptoms to both, and though the cough is very disturbing, yet I think it is rather a relief than otherwise, because it helps to promote expectoration, a symptom the most favourable to nature, when it is laudable, and of most pernicious consequences when it abates, or manifestly flags, especially before the height of the disease. The pulse under all inflammatory fevers is hard, tight, and equal, from the glut of blood which at that time distracts the arteries ; the urine is little and thin, pale and watery. In respect of the stools there is no general rule, for some are cos-

tive, others loose, though both in extremes are dangerous.

“ The blood, when extracted by bleeding, appears extremely sizie, with a scum upon its surface ; and when it has stood to separate, gathers a film or flesh coloured skin upon it, which phenomenon the great Sydenham supposed to arise from the precipitation of the febrile matter. But if we consider the divisions the blood suffers, and the extreme heats that attend inflammatory fevers, we may more reasonably suppose it to arise from some little portions of the red globules, dissolved and mixed with the serum, by the force of the vessels ; which union constituting a mass lighter than the globules, is the last in settling to the centre, which is the reason why it always clings about the surface of the crassamentum.

“ The ancients in general, and many of the moderns, have supposed the blood to cause pain through its great acrimony or extreme sharpness, vellicating the nervous fibres of those parts, through which it circulates ; but I know no necessity for maintaining that supposition, or why in *all* pains we should suppose the blood to acquire a sharp acrid, fretting disposition, when we know by experience, that pain, even the most acute, may be produced by a distraction of the vessels ; for all acute diseases arise from the greatness of the pain, and

the greatness of the pain is caused from the distraction of the nerves, which are more or less acutely sensible; as the part wherein it is seated is more or less nervous, and as those nerves are more or less distracted with their fluids. But those nerves can only be distracted when the vessels they compose are too much distended with blood; and they will be only too much distended with blood, whenever it divides faster than the excrements it parts with, can be flung off by the secretory emunctories, and, of consequence, will lodge in the minutest canals of those parts disposed to receive it, and excite an inflammation, which, with the great heat and thirst that attends it, we call a fever of the inflammatory kind, in what part soever seated. And this appears most evidently in inflammatory fevers that attack the breast, especially the pleurisy, that the disease in the beginning, or at least a little after the invasion, is most commonly attended with the severest and most acute pain, which, in two or three days, somewhat abates; that is, when some of the smallest vessels, that suffered the greatest distension, and consequently the greatest pain, are broke, the others relax, and, of consequence, the pain remits, which appears still more clearly from the spittles being mixed with streaks after the second or third day; and what mightily adds to the strengthening of this opinion is, that the method of cure, or at least that



method which gives the greatest relief under the most pressing symptoms, will best justify this manner of reasoning; for we observe, all remedies applied in pleurisies, or other inflammatory diseases, to give the greatest relief, that most diminish the quantity of blood, that distracts the vessels, and that is, either bleeding, or a plentiful breathing.

“ But if those pains were caused by sharp, acid humours fretting the parts, it is impossible to conceive, how either bleeding, or a plentiful discharge of any other evacuation, could give such sudden relief, especially the former, in some grievous pleuritic pains is known to give, and that almost in a moment.

“ The immediate cause, therefore, of all acute inflammatory fevers, and, consequently, of a pleurisy, or pleuripneumony, arises from a contraction of the heart and arteries, elevated above the balance of nature.

“ This over-elevated contraction of the heart and arteries too much fuses the blood, and causes it to take up more room in the arteries, whereupon a greater glut is determined upon the lungs, pleura, intercostal muscles, and sometimes diaphragm, greater than the vessels of the aforesaid parts can dispense with, which stagnates, and immediately turns to an inflammation, that excites all those symptoms of fever, heat, &c. that generally attend



a pleurisy and pleuripneumony; and this inflammation thus lodged in the side, if not timely dispersed, and raised by a laudable spitting of concocted matter, effected by plentiful bleeding and sweating, the only proper and safe methods to be used in such cases, sometimes turns to an abscess, and matter begins to gather in the breast, and then it changes its name of a pleurisy for that of an empyema.

“An empyema is a collection of pus or matter lodged in the breast, most commonly proceeding from the severer kinds of pleurisies, when for want of timely bleeding, they go not kindly off; but it may proceed from a wound, blow, or bruise, or the inclination of the breast to receive a load of humours.

“The symptoms that indicate this indisposition a-forming, are great heat, pain, and inflammation, that disperse not with the fever, but remit only, as the inflammation more or less advances to suppuration. A great heaviness, with a continual slow fever, such as attends chronic diseases; a weak, quick, pulse, such as accompanies hectic dispositions, are inseparable companions to empyemas, and indeed he will have great fortune if he escapes; for a shortness of breathing, a dry cough, and intense thirst, are inseparable symptoms; he sleeps little, and wastes daily, especially before it is opened; and

the discharge that is generally made, after the aperature of the breast, is hardly to be restrained, and seldom leaves the patient, till it brings him into a marasmus, or downright consumption.

“ But these causes, which in some will seize upon the lungs and breast, and excite a pleurisy or empyema, in others will fix upon the uvula and muscles of the larynx, and cause a quinsy.

“ A genuine quinsy is an inflammation of the throat, with a swelling and pain of the tonsils and muscles of the larynx. It is ushered in with a shivering, shaking, and other symptoms of cold; a fever follows, with great heat, pain, and inflammation, about the jaws, to which succeeds a tumour among the muscles, near the os hyaides, about the root of the tongue; so that if the disease come to any height, the swallowing and breathing both become extremely difficult, upon which he is under apprehensions of being strangled, by reason of the inflammation and tumour of the uvula, almonds, and larynx; sometimes swallowing is wholly impeded, and the liquids taken inwardly, immediately return by the nose; and though this affection is not so painful as the former, yet is it full as dangerous, for in this the patient is under continual apprehensions of being choked, if not timely relieved.

“ The immediate cause of a quinsy is from the blood stagnating in those parts, because the con-

traction of the carotid arteries is elevated above the balance of nature, which determines a greater glut than those parts can detach by the secretory vessels, upon which a lodgment is made, which excites an inflammation, fever, quick pulse, and all the fore-said symptoms.

“The prognosis of inflammatory diseases are always dangerous, but in relation to the parts where they are seated, some are more so than others. Those inflammatory fevers that attack the breast, such as the pleurisy and pleuripneumony, are very often of pernicious consequence; and of them, by reason of the symptoms attending, some prove more fatal than others. An extreme difficulty of breathing, with severe acute pains, attended with a hard, hollow, dry cough, after the seventh day, portend death near at hand. On the contrary, if the cough be never so severe, if a laudable expectoration follow it, and breathing be not extremely short, there is hopes of safety; but if the fever retreat upon the nerves, and a delirium seize the patient, it is deadly. A looseness happening in the beginning of a pleurisy is a very dangerous symptom, though a flux is much safer in a dry pleurisy than a moist one. A weak pulse, cold sweats, and difficulty of breathing, all indicate death near at hand.

“An empyema is always dangerous, and most commonly mortal, for it often degenerates into a

phthisis, especially if it spring from a pleuripneumony; if it arise from a pleurisy it is less dangerous, and, by a timely apertion in the breast, sometimes the patient escapes.

“The prognostics of a quinsy are to be taken from the difficulty of swallowing, and want of a free respiration: if the tumour break inwardly, and the matter fall upon the lungs, it, for the most part, proves a deadly prognosis. In a word, if the inflammation be not in the beginning discussed, it generally chokes the patient, or is translated to the lungs, and so excites a phthisis.”

With this quotation, I conclude what I have to say on the subject of the Results of Fever.

## CHAPTER VIII.

## OF THE TREATMENT OF FEVER.

To him who has attended to the preceding part of this treatise, it will be evident that fevers are of two kinds, viz., first, those which are attended with reaction, (i. e. increased action of the heart and arteries,) and, secondly, those which are marked with the symptoms of collapse, (i. e. want of energy in the action of the heart and arteries, and congestion of the blood in the capillary vessels generally, and, particularly, in the large veins.) And these two states, very different in their nature, may characterize fevers depending on increased irritation of whatever organ. From which I infer, that there is an ordinary healthy irritation as well as an ordinary unhealthy or morbid irritation, to which the system is subject. The one is called a good habit of body,

—the *Ευεξία* of the Greeks, or *bona corporis habitudo* of the Romans—the other, a bad habit of body, —their *Κακεξία*, or *mala corporis habitudo*. In reference to these conditions of the body, I apprehend Hippocrates to say, in his third aphorism, section 3, as translated by me, “In those who take exercise, [i. e. in those who undergo bodily exertion in the open air], if they are excessive, good habits of body are dangerous, [i. e. extreme good health is dangerous]. For they [i. e. it] cannot remain in the same state and be stationary. But since they [i. e. it] cannot increase any more for the better, they are [i. e. it is] left, therefore, for the worse. Wherefore, on account of these, it is proper, without delay, to dissolve [or reduce] a good habit of body, in order that the body [i. e. the system] may resume the principle of renutrition [i. e. gradually regain its vigour]. Nor is it proper that symptoms should lead to excess [in the employment of remedies], for this is dangerous. But as the nature [of the person who is about to submit to them] may be, [to this extent, or so far, they may lead.]” (That is, it is requisite to compare the symptoms with the patient’s constitutional strength before determining on administering remedies, lest, being misled by the symptoms, we presume too much on his natural strength.)—“In like manner, also, evacuations carried to extreme are

dangerous. And again, repletions, being in excess, are dangerous." I conclude, therefore, that an excess of irritation occurring in whatever organ, in a good habit of body, will develop a fever attended with reaction; whereas, an excess of irritation taking place in any organ, in a bad habit of body, will give rise to a fever attended with the symptoms of collapse. But a bad habit of body may be of two kinds, viz., first, that attended with a redundancy of the circulating fluids; secondly, that which is marked by a deficiency of them. These states or conditions of the system are known by the familiar expressions of unhealthy-plethora, and anæmia, to which last expression I will prefix the word unhealthy also; meaning, in plain English, an unhealthy bloodlessness. On the other hand, a good habit of body may, also, be of two kinds, the one called a healthy-plethora, the other I shall call a healthy-anæmia or healthy bloodlessness. Now, I think, I have somewhere remarked, in the preceding part of this treatise, that the term irritation, whether it refers to healthy or morbid irritation, includes the ideas of something capable of being irritated and an irritating cause or agent. It, therefore, stands to reason, that the irritability, whether healthy or morbid, being in excess, a slight or ordinary irritating cause will give rise to increased irritation; and that the irritability, whether healthy or morbid, being deficient, a great



irritating cause will be required to develop increased irritation.

From the foregoing observations taken together, it results, that there is a healthy-strength as well as an unhealthy-strength; and that there is a healthy debility as well as an unhealthy-debility.

Upon the truth of these observations, therefore, which confidently appeals, for confirmation, to the common sense and candour of all enlightened medical practitioners, my treatment of fever will be based.

But the irritability of a part, whether healthy or morbid, is, in the direct ratio of its supply of arterial blood. If, therefore, the circulation of arterial blood, whether healthy or unhealthy, be vigorous, the irritability of the part will be increased; if, on the contrary, it is feeble, its irritability will be deficient. Again, the quality of the arterial blood, whether it be healthy or unhealthy, determines the nature of the irritability of any given organ or part, and of that of the system in general. And the quality of the blood, whether it be healthy or unhealthy, depends on the quality of the inspired air, whether it be pure or impure; on the nature of the aliment, whether it be fresh or corrupted, animal or vegetable, stimulating or the reverse, fluid or solid, acid or acrid, &c. The quality of the blood is, also, very much influenced by the activity or inactivity of the

secreting organs, whereby it is either purified or rendered impure.

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## TREATMENT OF FEVERS IN PARTICULAR.

### ARTICLE I.—*Treatment of Cerebral or Nervous Fever.*

Should the symptoms indicating disorder of the functions of the brain and nervous system, be marked by vigorous action of the heart and arteries, no loss of strength,—lively delirium, pain and increased activity of the senses, in a plethoric habit of body ; it will be necessary, in the first place, to exclude the light from the apartment ; to keep the patient as quiet as possible ; and to remove, as much as possible, all disquieting thoughts ; to keep the apartment as agreeable as possible by allowing the free ingress of fresh air ; to remove all unnecessary heat from the patient ; to abstract all solid aliment, allowing just sufficient drink, tepid or cold, according to the patient's wish, as may be requisite to allay any existing thirst. Should there be present, remarkable suppression of any of the secretions, means should be

used to restore it. But should these means not be effectual in reducing the violence of the symptoms, it will then be advisable to have recourse to general depletion; and this may be effected by purging, especially with the neutral salts, after the solid contents of the intestines have been previously removed by some more active medicine, as castor oil, calomel and jalap, or cream of tartar and jalap, &c.; by general and local blood-letting, which should be always avoided, if possible; and by blistering, which should never be used except in the decline of the disease, when other means have been employed without success. By the judicious and timely application of the preceding remedies, the generality of nervous or cerebral fevers, occurring in a healthy plethoric constitution, will be easily subdued.

Should, however, on the other hand, the symptoms of disturbance of the animal functions be attended with prostration of strength; general restlessness, without any defined pain; weak action of the heart and arteries; low muttering delirium; stupor and insensibility to light and sound, in a plethoric habit of body; it will be necessary, immediately to raise the action of the system, by the use of the cold douche directed to the crown of the head, the occiput, and back of the neck, (if at the same time the patient's body be immersed in water of temperature 98 or 100 degrees of Fahrenheit's

thermometer, it will be so much the better) ; the exhibition of an emetic ; or the abstraction of a small quantity of blood from the arm, immediately followed by a stimulating draught, such as wine, warm brandy and water, or any aromatic tincture productive of similar effects, taking care, however, not to exhibit so much as to produce intoxication. Reaction having been produced by these means, it will be necessary, without delay, to direct our attention to the removal of that state of things which constitutes the peculiar nature of the disease ; which is, as we have before shown, an undue accumulation of blood in the brain and spinal marrow, occurring in an unhealthy-plethoric state of the system. For this purpose, it will be necessary to evacuate the bowels freely, taking care that the medicine employed be of such a kind as will effectually expel their solid contents, in the first instance ; which must be succeeded by the use of neutral salts, for the purpose of reducing the quantity of the circulating fluids. This treatment, conjoined with the exhibition of sudorifics and alteratives, farinaceous nourishment, and acid fruits, together with the occasional application of a blister to the nape of the neck, in the latter stages of obstinate cases of simple uncomplicated nervous fever, occurring in an unhealthy-plethoric state of the body, will generally be found sufficient to effect a cure. But if the disease resist this treatment, it

must then be considered as a very complicated one, the treatment of which will be considered under the head of Typhus-fever.

If, however, symptoms of fever marked by active disorder of the animal functions, occur in an inane state of the body, it will be requisite, during the intermission, not only to stimulate the stomach, and other organs, which sympathize with the brain and spinal marrow, in the state of health ; but also to administer light, unirritating, easily-digestible, nourishment ; as well as to remove all causes of mental and sensual irritation. But that variety of this species of nervous fever, marked by low-muttering delirium, and its treatment, will be probably noticed under the head of Typhus-fever.

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## ARTICLE II.—*Treatment of Gastric or Abdominal Fever.*

When symptoms of fever occur, accompanied with active irritation of the stomach and bowels, (i. e. vomiting, and purging,) in a full habit of body, it will be necessary, in the first place, even if there is reason to think that the primæ viæ are in a loaded state, to avoid interfering with the salutary opera-

tions of nature, as they will usually be found sufficiently efficacious. As soon, however, as the object of evacuating the first passages is accomplished, it will be necessary carefully to abstain from the use of any thing, which may increase the irritation already existing in the stomach and bowels. For this purpose the patient must observe a rigid abstinence from nourishment of any description. As thirst, however, is a remarkable symptom of this affection, in most cases very distressing, it will be proper to moisten the patient's tongue occasionally, by administering a spoonful of cold water at convenient intervals; but the greatest care should be taken to prevent him from taking large draughts of any liquid, lest vomiting be excited—a symptom, in such cases, most difficult to allay. It will be sometimes requisite to conjoin with the use of these means, general blood-letting, and cold applications to the region of the stomach, and laxative enemata will usually be found efficacious in the cure of this malady.

On the other hand, should febrile symptoms occur, attended with passive irritation or oppression of the stomach and bowels, such as sickness without vomiting, and costiveness, headache, &c., it will be necessary, without delay, to excite vomiting; and, within a reasonable time afterwards, if the costiveness still remain, to resort to purging—first, with a view of evacuating the solid contents of the

intestines, and then, to produce liquid dejections. The employment of these remedies followed up with the use of sudorifics, will in general be found equal to the cure of this disease.

In all febrile complaints, however, attended with either active or passive irritation of the stomach, bowels, and other abdominal viscera, occurring in a spare habit of body, whether healthy or unhealthy, we should carefully abstain from the use of emetics; and even purgatives should be used with the greatest caution; for, instead of producing evacuation of the stomach and bowels, in such habits they only propagate the irritation to the nervous system, and thus give rise to the most distressing and, frequently, dangerous symptoms. The most proper mode of proceeding in such cases, therefore, is to endeavour to subdue the active irritation, in the first instance, by carefully abstaining from the use of internal stimulants, while stimulants are externally applied for the purpose of exciting counter-irritation. As such complaints, however, are given to intermit their violence, it will be necessary to take advantage of the opportunity, thus afforded, to administer light, nutritious, easily digestible, and, usually, farinaceous aliment, accompanied, sometimes, by the use of some gentle tonic or stimulant taken inwardly. These means will be found quite sufficient to effect the cure of such diseases occurring in a healthy subject,



with a spare habit of body. But when they take place in unhealthy subjects with spare habits, then, in addition to the treatment above stated, it will be indispensable cautiously to resort to the use of sudorific and alterative medicines, coupled with gentle laxatives, together with a liberal use of tonic medicines, such as acids, both vegetable and mineral; sponging the surface with tepid water, or vinegar and water; the free admission of fresh air; and when this is not procurable, to fumigation with those gases which are capable of supplying oxygen to the blood. This concludes what I have to say, in this place, of the treatment of gastric or abdominal fevers.

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ARTICLE III.—*Treatment of Pulmonary or Catarrhal Fevers.*

When fever occurs accompanied with symptoms of active irritation of any of the respiratory organs, such as dry cough, difficulty of breathing, painful respiration, &c., (as is noticed under the head of Symptoms of Pulmonary or Catarrhal Fever,) in a full habit of body, it becomes necessary, in the first place, that the patient should abstain from the use

of all stimulating aliment, the smallest quantity of some demulcent drink being made use of in order to relieve the irritation which gives rise to coughing. It will usually, at the same time, be necessary to administer some bland or cooling laxative, such as Epsom salts or castor oil, according as the serous or mucous membrane of the lungs may be the seat of irritation. Blood-letting will sometimes be necessary, but this also must be regulated by reference to the particular membrane affected. If the mucous membrane be the seat of increased irritation, it will be proper to apply leeches or cupping-glasses to the chest; if, on the other hand, the pleura be affected, general blood-letting will be found most efficacious. When blood-letting and purging have been resorted to, the patient may be allowed to drink liberally of demulcent decoctions, such as barley and rice-water, or solution of gum arabic, or extract of liquorice, &c., and he should also be permitted to take light farinaceous nourishment; but he should still carefully abstain from taking either tea or coffee, and much more anything stronger or more stimulating. These means faithfully employed, will be found equal to the cure of the generality of such cases.

If, however, symptoms of oppression or passive irritation of the chest should occur, together with the phenomena marking congestive fever, such as slow, difficult respiration, occasionally obtuse pain,

stitches, and slight cough when an attempt is made to inhale, sighing, a bloated countenance, with livid complexion, oppressed pulse, heat of surface not much increased, &c., in a full habit of body, no time is to be lost in abstracting blood, both generally, from the arm, and locally, from the chest. This practice should be immediately followed up by the exhibition of diuretics and diaphoretics combined with diffusible stimulants, and other alterative medicines, such as nitrate of potass, small doses of ipecacuanha, or antimonial powder, in combination with camphor, the preparations of ammonia and calomel, to which may be added the free use of demulcent acidulated drinks, and acescent fruits. These means, together with the judicious use of purgatives, fumigation, or pure air, will generally be successful.

Cases of pulmonary or catarrhal fever occurring in a spare habit of body require to be treated with the utmost caution. Here bleeding, whether local or general, is not only useless but positively injurious. If the patient be of a healthy-spare habit, it will be requisite to resort to counter-stimulants applied externally, simple demulcent drinks, and light, nutritious, farinaceous aliment, which, judiciously applied, will be generally found to be successful. But in the event of a similar affection occurring in an unhealthy-spare habit, it will be

requisite to conjoin, with the remedies just enumerated, the use of sudorifics and gentle laxatives, so combined with light, nutritious, farinaceous aliment, and sometimes animal aliment, acescent, demulcent drinks, and acid fruits, as not to weaken the patient.

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ARTICLE IV.—*Treatment of Inflammatory or Vascular Fever.*

As there are four varieties of this species of fever, the treatment will vary according to the circumstances of each individual case. That variety which depends on irritation excited primarily in the heart and arteries, in a healthy plethoric system, will require little more to subdue it, than general blood-letting, repose, diet, and the use of demulcent drinks. On the other hand, when primary irritation of the heart and arteries—(I say primary, as contradistinguished from sympathetic irritation)—develops fever in an unhealthy, plethoric system, it will be necessary to add to the treatment just recommended, the use of sudorifics, alteratives, and mild purgatives, particularly calomel in large doses, demulcent acidulated drinks, and light farinaceous food, during

the remissions of the disease, together with acescent fruits. But fever, depending on primary irritation of the heart and arteries, in healthy-spare habits of body, will be generally cured by the removal of the exciting cause, repose, demulcent drinks, and light farinaceous food, during the intermission. In similar cases, however, which arise in unhealthy-spare habits, it will be necessary to add to the curative means just enumerated, the use of sudorifics, alteratives, gentle laxatives, acescent demulcent drinks, acidulous fruits, and the judicious exhibition of tonics, during the intermissions.

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#### ARTICLE V.—*Treatment of Rheumatic Fever.*

As rheumatic fever is justly considered to be only a variety of inflammatory fever, what has been said in the last article applies also to this; but as this disease most generally affects persons of a peculiar temperament, called the rheumatic diathesis, what was said in reference to inflammatory fever occurring in an unhealthy-plethoric habit of body, applies here with peculiar force. When this fever is the

result of a peculiar state of the atmosphere (which it frequently is) in any given locality, change of air must be resorted to as soon as circumstances will allow.

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ARTICLE VI.—*Treatment of Glandular or Muco-glandular Fever.*

What has been said in reference to the treatment of the preceding species of fever will apply generally here, allowance being made for the nature of the organs which are the seat of this disease. But the epidemic variety of this disease depends on a peculiar constitution of the blood, induced, generally, by meteoric changes, influencing the state of the atmosphere and vegetation, in particular regions of the globe, at particular seasons, and will be considered under the head of Plague.

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ARTICLE VII.—*Treatment of Erysipelatous or Cutaneous Fever.*

The peculiarity of this species of fever consisting in increased irritation determined to the skin, occurring in whatever constitution or habit of body, it is evident that its general treatment will be the same as that recommended in other fevers. The local affection, however, will sometimes require attention. If, therefore, the irritation of the skin run high, and the patient be of a healthy-plethoric habit, cold, un-irritating applications should be resorted to, as cold bathing or cold ablution, the solution of the acetate of lead, &c. The same also may be conjoined with the appropriate general treatment, already described in the preceding articles, if the patient be of an unhealthy-plethoric habit. But when erysipelatous fever occurs in spare habits, great care should be taken not to chill the surface, lest the blood, already inclined to forsake the superficies, should accumulate in the central or vital organs, and thus extinguish life. And if, when this disease occurs in an unhealthy-spare habit, the eruption should be very faint, or, after appearing, should become inconsiderable, or suddenly disappear, then it will be necessary to apply blisters, or other counter-irritants, to the skin, in order to favour the languid action of the



system. In such cases, it will also be necessary to have recourse to the diffusible stimulants in combination with calomel and quinine, or other permanent stimulants.

This concludes what I have to say, in this place, in reference to the treatment of the different species of simple-uncomplicated-fever occurring in different habits of body.

I said, in a preceding part of this treatise, that I considered continued, remittent, and intermittent, not to be forms, but conditions of fever. Accordingly, in considering the treatment of the different species of fever, we have found that fever continues, remits, or intermits, in proportion as the subject of it happens to be of the healthy-plethoric, unhealthy-plethoric, healthy-spare, or unhealthy-spare habit of body; and we have found, moreover, that these conditions may occur in fever of whatever species.

Thus have I accomplished what I purposed doing, in the commencement of my work, for which I heartily thank God; and I hope that as my labours have been of service to myself, in determining the true nature and proper treatment of fever, so they may prove serviceable to others who have experienced difficulty in arriving at a definite conclusion in reference to these subjects,

Whether I shall be able to go to press (as I purposed doing) with my observations and views in

reference to Plague, Yellow Fever, Cholera, Typhus Fever, and Sea-Scurvy, (out of which will naturally flow the discussion of the question of contagion, and the propriety or impropriety of the existence of quarantine laws,) will much depend on the reception which awaits this little work, commenced six years ago, while I was residing in the West Indies. All that I can now say on the subject is, that I shall be very happy to do so if circumstances permit.

*Of the Nature, Cause, and Treatment of Epidemic  
Yellow Fever, Typhus Fever, Plague, Cholera,  
and Sea-Scurvy.*

HAVING, by God's help, been enabled to accomplish the former part of my work on fever, as I think it would be incomplete without the consideration of Yellow Fever, Typhus Fever, Plague, Cholera, and Sea-Scurvy, I proceed without delay to the accomplishment of this part of my undertaking, looking for that help by which I have been able to perform the preceding.

Accordingly, as I think I have already said, that I believe these affections to be but varieties of one *great species* of disease depending on the same great cause, I shall consider them all together, showing wherein they agree and where they differ, and comparing their symptoms, causes, and treatment, with each other.

Proceed we then to observe, that (according to Dr. Hooper, who I believe is universally acknowledged in the medical world, at least in this country,

to be a good compiler) the “symptoms of yellow fever, or Synochus Icterodes,” are as follow:—  
“Weakness ; lassitude ; weariness ; frequent chilliness ; faintness ; pains in the head and eyeballs ; sighing ; great tendency to coma ; mouth clammy ; tongue furred ; pulse variable ; skin hot, dry, and hard ; *bilious vomiting very frequent* ; yellowness of the eyes and skin ; incessant retching and vomiting of frothy bile ; peculiar delirium, attended with dilated pupils ; great determination of blood to the head ; occasional remissions of fever ; extreme debility ; petechiæ ; *large vibices* ; *black vomit* : dry and *black tongue* ; teeth covered with fur ; *hæmorrhage from mouth, ears, nostrils, or bowels* ; feeble and scarcely *perceptible pulse, hiccup, &c.* Those of “typhus (Typhus gravior) or putrid fever” are, “a sudden attack of the disease, more sudden than that of nervous fever or typhus mitior, and its progress is more rapid and violent ; the rigors are extremely severe, the prostration of strength greater and more early, and the expression of anguish and horror more acute. The heat of the skin is often moderate, though, in some instances, it soon rises to a degree greater than in any other fever, to 108° Fahrenheit, and is peculiarly acrid and burning to the touch. The pulse is quick, small, and possesses considerable hardness ; *nausea and bilious vomiting* ; intense pain in the head ; tinnitus aurium ; preter-

natural throbbing of the temporal and carotid arteries ; ferrety redness of the eyes ; extreme anxiety ; ferocious delirium ; the tongue is dry, and *covered with* a brown or *black crust* ; the breath is hot and offensive ; fetid sordes accumulate about the teeth ; the urine, at first pale, then becomes extremely *high coloured* and *fetid*, and in the last stage of the disease often *deposits a black sediment*. In the advanced stages, *hæmorrhages break out from different parts of the body ; blood is effused under the skin, forming petechiæ, maculæ, and vibices*. The *excretions become involuntary and extremely offensive ; gangrenous aphthæ appear about the mouth and throat ; the pulse sinks and intermits ; the extremities grow cold ; hiccup ensues ;* and before dissolution the patient exhibits a *most complicated scene of misery*." In reference to plague or Pestis, the same author observes, "The plague, a disease *characterized by typhus fever*, which is contagious in the extreme: *prostration of strength*, buboes, and carbuncles ; *petechiæ, hæmorrhage and colliquative diarrhæa*. By some writers the disease has been divided into three species ; that attended with buboes, that attended with carbuncles, and that accompanied with petechiæ. This division appears wholly superfluous. Dr. Russel, in his elaborate treatise on the plague, makes mention of *many varieties* ; but, when these have arisen, they seem

to have depended in a great measure on the *temperament* and *constitution* of the *air* at *the time the disease became epidemical*, as likewise on the patient's *habit of body at the time of his being attacked*. The plague is by *most* writers *considered* as the consequence of a *pestilential contagion*, which is *propagated* from *one person to another* by *association*, or by *coming near infected materials*.

It has been *observed* that it *generally appears as early* as the *fourth* and *fifth day after infection*, but it has not yet been ascertained how long a person who has laboured under the disease is capable of infecting others, nor how long the *contagion* may lurk in an unfavourable habit without producing the disease, and may yet be communicated, and the disease excited, in habits more susceptible of the infection. It has generally been *supposed*, however, that a *quarantine of forty days* is *much longer* than is *necessary* for *persons*, and probably for *goods also*. *Experience has not yet determined how much* of this term *may be abated*. It sometimes happens that, after the application of the *putrid vapour*, the patient experiences only a considerable *degree of languor* and *slight headache* for *many days* previous to a *perfect attack* of the disease; but it *more usually* comes to pass that he is *very soon seized* with *great depression of strength*, *anxiety*, *palpitations*, *syncope*, *stupor*, *giddiness*,

*violent headache, and delirium, the pulse becoming at the same time very weak and irregular. These symptoms are shortly succeeded by nausea and a vomiting of a dark bilious matter; and in the further progress of the disease, carbuncles make their appearance; buboes arise in different glands, such as the parotid, maxillary, cervical, axillary and inguinal; or petechiæ, hæmorrhages, and a colliquative diarrhœa, ensues, which denotes a putrid tendency prevailing in a great degree in the mass of the blood. Such are the characteristic symptoms of this malignant disease; but it seldom happens that they are all to be met with in the same person. Some, in the advanced stage of the disease, labour under buboes, others under carbuncles, and others, again, are covered with petechiæ."*

In describing cholera, Hooper remarks, "Celsus derives it from  $\chiολη$  and  $\rho\epsilon\omega$ , literally a flow of bile; and Trallian, from  $\chiολας$ , and  $\rho\epsilon\omega$ , *intestinal flux*.) *Felliflua passio. Cholera morbus.* It is a *purging and vomiting of bile, with anxiety, painful gripings, spasms of the abdominal muscles, and those of the calves of the legs.* There are two species of this genus: 1. *Cholera spontanea, which happens, in hot seasons, without any manifest cause.* 2. *Cholera accidentalis, which occurs after the use of food that digests slowly, and irritates.* In *warm climates* it is met with *at all sea-*



*sons of the year*, and its occurrence is very *frequent*; but in *England*, and other *cold climates*, it is apt to be most prevalent in the *middle of the summer*, particularly in the *month of August*; and the *violence of the disease* has usually been observed to be greater in proportion to the *intensity of the heat*. The spontaneous species is produced by causes which influence the liver, so as to cause a superabundant secretion of bile, mostly of an *acrimonious quality*, such as suppressed perspiration in very hot weather; from *cold* or *damp incautiously applied* to the *feet*, and by taking cold drinks, especially when the body is considerably heated by exercise. *This species is mostly epidemic at the close of summer or the beginning of autumn.*" Sydenham says, "*As certainly as the appearance of swallows in the spring, or cuckoos about the dog-days.*" At this time the heat of the skin stimulates the liver to an inordinate secretion of bile, so that the alimentary canal becomes overloaded with it, the blood somewhat impregnated, while the liver itself is debilitated by undue action. The accidental species is generally caused by *cold and indigestible fruits, as unripe apples and pears, cucumbers, melons, mushrooms; drastic purges, sudden frights, &c.* It usually comes on with soreness, pain, distension and flatulency in the stomach and intestines, succeeded, quickly by a severe and

frequent vomiting, and purging of bilious matter, *heat, thirst, a hurried respiration*, and *frequent* but weak and fluttering pulse. When the disease is not violent, these symptoms, after continuing for a day or two, cease gradually, leaving the patient in a debilitated and exhausted state ; but where the disease proceeds with much violence, there arises great depression of strength, with cold clammy sweats, considerable anxiety, a hurried and short respiration, and hiccoughs, with a sinking and irregularity of the pulse, which quickly terminate in death ; an event that not unfrequently happens within the space of twenty-four hours."

"He describes scurvy (scorbutus, derived from the German word *schorboet*, *Porphyra* of Dr. Good,) as being a disease " *characterized by extreme debility ; complexion pale and bloated ; spongy gums ; livid spots on the skin ; breath offensive ; œdematous swellings in the legs : hæmorrhages ; foul ulcers : fetid urine ; and extremely offensive stools*. The scurvy is a disease of a *putrid tending* nature, much more prevalent in *cold climates* than in *warm ones*, and which chiefly affects *sailors*, and *such as are shut up in besieged places*, owing, as is supposed, to their being *deprived of fresh provisions, and a due quantity of acescent food*, assisted by the prevalence of cold and moisture, and by such other causes as depress the nervous energy, as

indolence, confinement, want of exercise, neglect of cleanliness, much labour and fatigue, sadness, despondency, &c. These several debilitating causes, with the concurrence of a diet consisting principally of *salted* or *putrescent* food, will be sure to produce this disease. It seems, however, to depend more on a *defect* of nourishment than on a vitiated state; and the reason that salted provisions are so productive of the scurvy, is most probably, because they are drained of their nutritious juices, which are extracted and run off in brine. As the disease is apt to become pretty general amongst the crew of a ship when it has once made its appearance, it has been supposed by many to be of a contagious nature; but the conjecture seems to be by no means well founded. A preternatural saline state of the blood has been assigned as its proximate cause. It has been contended by some physicians, that the primary morbid affection in this disease is a debilitated state of the solids, arising principally from the want of aliment. The scurvy comes on gradually, with *heaviness, weariness, and unwillingness to move about, together with dejection of spirit*, considerable loss of *strength and debility*. As it *advances in its progress*, the *countenance* becomes *sallow*, and *bloated*, *respiration* is *hurried* on the least motion, the teeth become loose, the gums *are spongy*, the *breath* is *very offensive*, livid spots appear on

different parts of the body, old wounds which have long been healed up break out again ; severe wandering pains are felt, particularly by night ; the skin is dry, the *urine small in quantity, turning blue vegetable infusions of a green colour* ; and the pulse is small, frequent, and, towards the last, intermitting ; but the intellects are for the most part clear and distinct. By an aggravation of the symptoms, the disease, in its last stage, exhibits a most wretched appearance. The joints become swelled and stiff, the tendons of the legs are rigid and contracted, general emaciation ensues, hæmorrhages break forth from different parts, fetid evacuations are discharged by stool, and a diarrhœa arises which soon terminates the tragic scene."

Scurvy, as usually met with on shore, or where the person has not been exposed to the influence of the remote causes before enumerated, is unattended by any violent symptoms ; as slight blotches, with scaly eruptions on different parts of the body, and a sponginess of the gums are the chief ones to be observed. In forming our judgment as to the event of the disease, we are to be directed by the violence of the symptoms, by the situation of the patient with respect to a vegetable diet, or other proper substitutes, by his former state of health, and by his constitution not having been impaired by previous disease."

Notwithstanding, in the foregoing quotations, Dr. Hooper, (from an old edition of whose Physician's Vade Mecum, I made the extract in question,) has described that variety of yellow fever called Typhus Icterodes, under the head of Synochus Icterodes; yet any one who has carefully followed me, will perceive a great general similarity, and, in many instances, a perfect identity in the symptoms of yellow-fever, typhus-fever, plague, cholera, and sea scurvy. However, as, in the decision, in a matter of such importance, it would not be just to adduce the testimony only of one solitary witness, I shall now advance what Dr. Thomas says, in his Modern Practice of Physic. In treating of Yellow Fever, which he calls Typhus Icterodes, he remarks, "Fortunate has it been for the inhabitants of this country, that the disease I am now to treat of, has never been introduced among them, notwithstanding their great intercourse with America and the West Indies, in which places it has spread universal terror and desolation, and in its fatality has equalled, if not exceeded, the plague itself, to which malady it indeed bears a strong similarity in many of its symptoms. Possibly the north of Europe may not be susceptible of its contagion. With respect to the origin of the yellow-fever, there has prevailed a great difference of opinion; some supposing it to have been introduced into America

from the West Indies ; and others, that it took its rise from the exposure of putrid animal and vegetable substances on the public wharfs of the city of Philadelphia ; which opinion is firmly supported by Dr. Rush, as he found the streets adjoining to these wharfs were the first in which the disease made its appearance, and that in several instances it could clearly be traced from thence to other parts of the city. Let this be as it may, it is evident from the report of Dr. Chisholme and others, who have written on the disease, that the fever which prevailed in Philadelphia was exactly the same as that which raged in the West India Colonies. Dr. Clarke informs us, that there appears to have been *such an extensive and very peculiar deranged state of the atmosphere* in the *towns* of the West Indies, and in North America, that it is *more probable* the disease *was produced* by this *general cause, breaking out* nearly at the *same time* in these *different places*, than that it was carried from the one to the other either by persons or by any kind of goods or merchandise. We are informed by Dr. Miller, of New York, that the yellow fever in America *always* begins in the *lowest* part of a *populous mercantile town near the water*, and continues there without *much* affecting *the higher parts*. It rages most where *large quantities* of *new ground have been made by banking out the rivers*, for the purpose of



constructing wharfs. The *appearance* and *prevalence* of the yellow fever in *high situations* have led to the belief, he tells us, that the disease was imported by ships from the West Indies. But a person seized with this fever in an affected part of the town, and conveyed to one that is healthy, or carried into the country, does not communicate it, he asserts, to the neighbourhood, nor to those immediately around him. He, therefore, is of opinion that the yellow fever is generated by the *impure air* or *vapour* which issues from the *new-made earth* or ground raised in the muddy and filthy bottom of rivers, and which *deteriorate* the *air* above it, in like manner as *air* becomes *offensive* and *injurious* when it approaches or passes over a body of *vegetable* or *animal matter* in a *state* of putrefaction. It appears that the shores of the rivers of New York and Philadelphia have undergone great and rapid alterations from their natural state within a few years, on account of the vast increase of commerce, and for the sake of making wharfs ; and Dr. Miller mentions, it is only in such parts where the alterations have taken place, that the yellow fever has been produced. The parts where little or no alteration has taken place in the east and north river, and which continues nearly in their natural state, do not produce the yellow fever. He adds, eighty new wharfs have been made since the war, the consequence of which



has been, that great quantities of *filth* and *corruptible matter deposited* in the *muddy bottom of the river, contiguous to the shore*, and which produced no ill effect while *exposed* to the *air*, and *washed twice every four-and twenty hours*, have been covered over several feet deep with new earth, and closely pent up so as to exclude the tide. It is in these places, and these only, that the yellow fever is produced, we are told. Some have imagined, that the fever, which has within these few years *occasioned such havoc and devastation*, is totally of a different nature from the yellow fever formerly met with in the West Indies and other tropical climates; but in my opinion, it seems to be the same, and that its only difference consists in having prevailed as an epidemic from the subsisting vitiated state of the atmosphere, and from its having, from other concurring circumstances, acquired a degree of *malignancy* and *virulence* unknown before.

“During a residence of nine years in the West Indies, from 1776 to 1785, I had frequent opportunities of meeting with the yellow fever among seamen and such new-comers as were imprudent on their first arrival, and although the disease never prevailed during that period as an epidemic, still I always looked upon it as highly contagious, and never failed to recommend the adoption of proper precautions to prevent its spreading.”

“It is probable that marsh *exhalations*, and the *effluvia arising* from *putrid animal* and *vegetable substances*, under a *concurring vitiated state of the atmosphere*, were the causes which *gave rise* to this fever, and that it was afterwards kept up by *contagion*, heightened by *various accidental circumstances*, to a *pestilential violence*. Very hot and *sultry weather*, with a *long drought*, will greatly *predispose* to the prevalence of this fever as an *epidemic*, in all tropical climates; and it *may* have a *similar effect* in America, where the summer months are intensely warm.

“Dr. Rush is of opinion that the yellow fever is not contagious in its simple state, and that it spreads exclusively by means of exhalations from putrid matters, which are diffused in the air; and a few other physicians have indeed entertained the same idea, to the great injury of the societies among whom they lived, by preventing the adoption of proper means for annihilating its contagion. Some facts have, however, been brought forward by Mr. M'Gregor in his medical sketches, which appear to me to establish the point very satisfactorily, that this fever may be communicated by contagion.

“The persons most liable to be attacked by it in the West India islands, were the Europeans who had lately arrived, and hence it was that the troops sent out to recruit our armies, and the seamen to

strengthen our fleet, fell its earliest victims. Women were observed to be less liable to its attacks than men, and children still less so than these, and the people of colour were by no means so apt to be seized with it as the whites. When the disease did appear among them, it was always much milder, owing most likely to their *necessary temperance*. Those of a *full plethoric habit*, and that were *intemperate* in their *mode of living*, were much *greater sufferers* by it than those of a lax fibre, and who were *guilty* of no *irregularity*. There is evidently something *peculiar* in the *constitution* of *people* from a *cold country*, which renders them more obnoxious to fever in a warm climate, than either the natives, or those who have been assimilated to it by a long residence. Accordingly, we find, that the same exposure to the causes, predisponent and occasional, will produce fever in a stranger, while the native, or old inhabitant remains in good health; and the symptoms will be *ten-fold more urgent* in the one than the other, supposing both are attacked. Hence it happens that residents and natives in general are not liable to the yellow fever, but when they are attacked with the remittent of the country, the symptoms partake more or less of the malignancy of the prevailing epidemic. The heat of the body of new-comers in the West Indies has been noticed by Dr. M'Kittrich to be between

three and four degrees above that of the temperature of the natives, and to this he ascribes, in part, the predisposition of the new-comers to the yellow fever.

“Dr. Pinckard, late a physician to the army in the West Indies, from having observed this fever exhibited such instability, and varied so incessantly in its character, that he could not discover any one symptom to be decidedly diagnostic, has been induced to offer it as his opinion (see vol. v. of Dr. Rush’s *Medical Observations of the University of Pennsylvania*,) that the yellow fever so called is not a distinct specific disease, but merely an aggravated degree of the common remittent or bilious fever of hot climates, rendered irregular in form, and augmented in malignity, from appearing in subjects unaccustomed to the climate.

“The yellow fever usually attacks with lassitude and weariness, chilly fits, listlessness of every thing around, faintness, giddiness, flushing of the face, redness of the eyes, pains in the eye-balls, and lower part of the forehead, as likewise in the back, debility and sighing, thirst, and a tendency to coma ; the urine is high coloured, small in quantity, and turbid ; the perspiration is irregular, interrupted, and greatly diminished ; the saliva is viscid ; the tongue is covered over with a dark fur ; the bile is secreted in unusual quantities, and thrown into the stomach, from which it is again speedily ejected, and the skin is hot, dry, and hard.

“The disease continuing to advance, the eyes become of a deep yellow, the face and breast are tinged with the same hue, and incessant retching and vomiting of frothy bile ensues ; great costiveness prevails, and a peculiar delirium arises, which is attended with a permanent dilatation of the pupils of the eyes. There is hardly ever an evident remission until the fever has entirely gone through its first stage, which is generally in thirty-six or forty-eight hours, when there is often such an abatement of symptoms as to induce the patient to think himself tolerably well ; but an early recurrence of the symptoms in an aggravated form, accompanied with extreme debility, soon convinces him of the contrary.

“In the last stage of the disease, the greatest debility prevails, and symptoms of universal putrefaction arise ; large patches of livid spots are to be observed on different parts, the tongue becomes dry and black, the teeth are incrustated with a dark fur, the breath is highly offensive, the whole body exhibits a livid yellow in many cases, but not in all ; hæmorrhages break forth from the mouth, ears, and nostrils, dark and fetid stools are discharged, hiccups ensue, the pulse sinks, and death follows very quickly.

“These are the usual appearances to be met with, but great irregularities have been observed by dif-

ferent practitioners. Dr. Chisholme mentions that he often found patients without any previous complaint, suddenly become giddy, lose their sight, fall down almost insensible, and remain in that state for half an hour or upwards; the body then became overspread with a cold sweat, and this was succeeded by intense heat, small hard pulse, violent pain of head, particularly in the forehead, great anxiety about the præcordia; the eyes were much inflamed, watery, protruded, and wildly rolling; the face was much flushed; there was great heat at the pit of the stomach, with nausea, frequent retching and vomiting, as also severe pains in the small of the back and calves of the legs.

“During twelve, eighteen, twenty-four, or thirty-six hours, he found all these symptoms continue to increase, except the quickness and hardness of the pulse, which were not materially changed, and that they were then succeeded by general coldness, clammy sweats, and a greater or less degree of coma or delirium. Life, in this case, was lengthened out to sixty or ninety hours from the attack. A short interval of reason perhaps took place, the patient considered himself better, and flattered himself for the moment with the hope of recovery; but a fit, as sudden and as unexpected as the first, came on, during which he rolled his eyes dreadfully, foamed at the mouth, and threw out and pulled back his



extremities in violent and quick alternate succession. Dr. Chisholme observes that in general the patient expired in this fit, but in a few instances he recovered from it, and continued rational for a short time, when another has ensued and carried him off.

“He noticed, that in a few instances, the patient complained of violent pains in the testicles, and on examination he perceived them much lessened in size and retracted, with an excoriation of the scrotum ; now and then he found a remarkable change in the voice, and that it became weak and shrill ; in a few instances he could discover little or no yellowness in the skin.

“Dr. Rush says, the disease appeared with different symptoms in different people : he observed the premonitory signs of it were costiveness, a dull pain in the right side, defect of appetite, flatulency, perverted taste, heat in the stomach, giddiness or pain in the head, a dull watery, brilliant yellow or red eye, dim and imperfect vision, a hoarseness or slight sore throat, low spirits, a disposition to sweat at night or after moderate exercise, or a sudden suppression of night sweats. More or less of these symptoms frequently continued for two or three days before the patients were confined, and in some they continued during the whole time of the prevalence of the fever in the city of Philadelphia, without producing the disease. Many went to bed in good



health, and awoke in the night with a chilly fit. Many rose in the morning after natural and regular sleep, and were seized at their work, or after a walk, with a sudden and unexpected attack. He observes that it frequently came on with a weak pulse, and often without any preternatural frequency or quickness; and that in some instances it was so low as not to be perceived without pressing hard on the artery; in some cases the pulse intermitted, and these intermissions occurred in several persons who were infected, but were not confined by fever; in others there was a more than ordinary slowness of the pulse, which was now and then accompanied with a dilated pupil of the eye. Hæmorrhages happened at the commencement of the disease, chiefly of the nose and uterus; and as it advanced the discharge of blood became more universal, and then issued from the gums, ears, stomach, bowels, and urinary passages. With respect to the secretions and excretions, there appeared to be a preternatural secretion of bile, which was discharged from the stomach and bowels in large quantities, and of very different qualities and colours, being in some cases yellow and in others black. The urine was sometimes plentiful and of high colour; sometimes it was pale, and at others it was small in quantity and turbid; moreover, sweats of a yellow colour, and highly offensive to the smell, often broke out. On

the first and second day the tongue was invariably moist and white, but as the disease advanced it became red, and put on a smooth shining appearance ; towards the close a dry black streak appeared in its middle, which gradually extended to every part of it.

“The effects produced on the nervous system were different, according as the fever affected the brain, the muscles, the nerves, or the mind. In a few instances apoplexy was induced, which usually proved fatal ; tremours of the limbs and twitchings of the tendons were common ; delirium was a frequent symptom, but many passed through the disease without the least derangement of ideas. In some cases the pain in the head was acute and distressing, and the stomach, towards the close, was affected with a burning or spasmodic pain of the most severe nature. The senses and appetites exhibited several marks of the ravages of the fever upon the body. Deafness and dimness of sight sometimes took place. Thirst and want of appetite were present, as in most other fevers. The convalescence was marked by a sudden renewal of the propensity to venery. The same is frequently noticed on recovery from the plague. Swellings in the inguinal and parotid glands took place in a few instances, which did not proceed to suppuration. In some cases the skin was preternaturally warm ; in others, it was cooler than

in health. The yellow colour was by no means universal ; when it took place it was seldom to be observed before the third day, but more frequently about the fifth or seventh from the first attack. The eyes seldom escaped a yellow tinge. There were eruptions of various kinds on the skin, and in the latter stage petechiæ were common ; carbuncles also took place in some. The disease ended in various ways. In some it was sudden ; in others it came on gradually. The last hours of some were marked with great pain and strong convulsions ; but, in many, death seemed to insinuate itself into the system with all the gentleness of natural sleep. In every case that came under Dr. Rush's care there were evident remissions or intermissions of the fever, or of such symptoms as were substituted for it. The disease continued for fifteen, twenty, or thirty days, in some people. He observed that all were affected by it ; but persons in the prime of life were most liable to it. Men were more subject to its attacks than women. He likewise observed that the refugees from the West Indies universally escaped from it ; whereas the natives of France, who were settled in the city of Philadelphia, were much annoyed by it ; and he found that the people of colour took the disease in common with the white people, but in them it was usually much milder.

Critical days were hardly ever distinguishable in

this fever, nor was the crisis often very evident. Sometimes a copious perspiration put an end to it; and, at others, the return of sleep, an hæmorrhage from the nose, or sudden diarrhœa, carried it off.

Dr. Fordyce is of opinion (see his fourth Dissertation on Fever) that typhus icterodes ought to be regarded rather as an irregular semi-tertian than as a continued fever; for it often happens that a patient becomes greatly relieved, and appears to be recovering, when all at once a fresh attack takes place and carries him off. He thinks that the dark brown colour of the skin in this fever arises rather from a greater secretion of the matter secreted by the sebaceous glands of the skin, than owing to a quantity of bile getting into the blood vessels. In support of this opinion he observes, that the colour is very different from that which takes place in jaundice. The evacuations from the intestines have not that clay-like appearance which is common in jaundice. The secretions from the kidneys have not that dark yellowish brown, or thick sediment, which have almost always been noticed in those persons in whom bile has got into the blood vessels. The dark matter which the patient throws up by vomiting, he thinks, has the appearance of the matter observed upon the tongue in very violent fevers, and that probably it is formed on the surface of the stomach, and perhaps of the duodenum, or

even on the beginning of the jejunum. The force of the exertions in vomiting, often occasions a greater quantity of bile to be secreted, and so to be thrown back into the stomach, and brought up with the dark matter. When this happens, it gives to the matter thrown up, he observes, the taste and appearance of bile. At other times, however, there is no appearance of bile at all, but only of *this dark brown matter*.

Concerning the nature of black vomit, various opinions have been entertained. Some have considered it as consisting of *putrid bile*; some, as *composed* of a mixture of *blood and bile*; some, of the villous *coat of the stomach dissolved* in the *progress of inflammation*, terminating in sphacelus; and others, of bile mixed with the septic acid contained in the alimentary canal; but Dr. Cathrall of Philadelphia (see the New York Repository of 1800, for his "Memoir on the Analysis of the Black Vomit," ejected in the last stage of this fever) considers all these opinions as erroneous, and offers it as his, that the black vomit is an *altered secretion from the liver*. We are informed by him that the black vomit, or matter so called, appears to be of two kinds, one consisting of a number of flaky particles, resembling the grounds of coffee, the other a dark-coloured inspissated mucus. From various repeated experiments, he concludes that the black vomit, be-

sides a considerable proportion of water tinctured with resinous and mucilaginous substances, contains a predominant acid, which is neither the carbonic, phosphoric, nor sulphuric, but hints it may be the muriatic. It appears from Dr. Cathrall's experiments, that the black vomit, when applied to the most sensible parts of the body, produces little or no effect. It likewise appears that large quantities of this fluid may pass through the stomach and bowels of quadrupeds and other animals without apparently disturbing the digestion or affecting the health. This fact incontestibly proves the inactivity of this fluid, and renders it probable that the speedy death which ensues after this discharge in yellow fever, is not from any destructive effect of this matter on the stomach and bowels, but most likely from the great degree of direct and indirect debility which has been previously induced. Another fact which has been proved by this gentleman's experiments is, that an *atmosphere highly impregnated with the odour of the black vomit recently obtained would not produce fever, apparently under the most favourable circumstances.*

In forming an opinion as to the event of the yellow fever, we must have in view the *nature* of the *symptoms*, the *mode of attack*, and the *age* and *habit* of the patient. *Youth*, and a *plethoric state*,



are *invariably circumstances of danger*. A sudden oppression of all the functions at once; great debility; weak, irregular pulse; sighing; severe vomiting of dark matter; tremours of the body when moved, with a tendency to faint on the slightest exertion; pensive sadness in the countenance; and a dilatation of the pupils of the eyes, with coma; are signs of great danger. Black and fœtid discharges of urine and stool, the breath being highly offensive, and the appearance of petechiæ, portend almost certain death.

“The symptomsthat we may regard as favourable are, a settled state of the stomach, lessened headache, eyes lively, appearance of an eruption on the skin, known in tropical climates by the name prickly heat, free perspiration, copious and high coloured urine, bilious flux, and sound sleep. No disease, however, exhibits a greater variety of symptoms, and is often less to be depended on, than this; for sometimes it goes on with favourable appearances, then suddenly changes to the worst, and sometimes patients, apparently almost in a state of convalescence, expire in a few hours.”

In reference to the putrid and malignant fever, or Typhus Gravior, Dr. Thomas observes, “This fever takes its name from the malignancy of its nature, and the evident symptoms of putrefaction which are to be observed after a continuance of



some days. It is readily distinguished from the inflammatory, by the smallness of the pulse, the sudden and great debility which ensues on its first attack, the brown or black tongue, the dark and fœtid sordes about the teeth, the livid flush of the countenance, and the acrid and more intense heat of the skin; and its more advanced stage, by the petechiæ or purple spots which come out in various parts of the body, and the fœtid stools which are discharged; and it may be distinguished from Typhus Mitior by the great violence of all the symptoms on its first coming on.

“The most general cause which gives rise to this disease is *contagion*, applied either immediately from the body of a person labouring under it, or conveyed in clothes or merchandise, &c.; but it may be occasioned by the effluvia arising either from vegetable or animal substances in a decayed or putrid state; and hence it is that in low or marshy countries it is apt to be prevalent when intense and sultry heat quickly succeeds to inundation. A want of proper cleanliness and confined air are likewise causes of this fever; hence it prevails in hospitals, gaols, camps, and on board ships, especially when such places are much crowded, and the strictest attention is not paid to a free ventilation and due cleanliness. A close state of the atmosphere, with damp weather, is likewise apt to give rise to Typhus Gravior.

“Those of lax fibre, and those who have been weakened by any previous debilitating cause, such as poor diet, long fasting, hard labour, continued want of sleep, are most liable to attacks of it. We are, therefore, to look on these as so many predisposing causes. It has been denied by some physicians of the present time, that either the plague, yellow fever, or typhus, are contagious diseases; and it is true indeed that we cannot, in every case, ascertain that the complaint originated from a communication with diseased persons; nor will the actual communication always produce fever: many predisposing causes are requisite; and, moreover, the human constitution is evidently less susceptible of disease at one time than at another. Whoever has paid proper attention to the symptoms of typhus may, however, be induced readily to conclude that the surrounding atmosphere, to an extent more or less great, particularly in small, close rooms, may become sufficiently impregnated with particles continually exhaling from the diseased body, to infect other persons with a similar disease.

“Some writers have supposed infants to be as liable to fever as adults, and from the same causes, but I cannot agree with them; for I have observed that infants do not readily take fevers, although exposed for a long time to that contagion which has appeared to affect adults round them; and every phy-

sician who attends lying-in hospitals must not only have known many infants suckled without injury, through the whole stage of bad fevers from which their mothers have recovered ; but also, in other instances, sucking greedily within an hour or two of their mother's death.

“ On the first coming on of Typhus Gravior the person is seized with languor, dejection of spirits, amazing depression and loss of muscular strength ; universal weariness and soreness ; pains in the head, back, and extremities, and rigours ; the eyes appear full, heavy, yellowish, and often a little inflamed ; the temporal arteries throb violently ; the tongue is dry and parched ; respiration is commonly laborious and interrupted with deep sighing ; the breath is hot and offensive ; the urine is crude and pale, the body is costive, and the pulse usually quick, small, and hard, and now and then fluttering and unequal. Sometimes a great heat, load, and pain are felt at the pit of the stomach, and a vomiting of bilious matter ensues. As the disease advances, the pulse increases in frequency, (beating often from 100 to 130 in a minute) ; there is vast debility ; great heat and dryness in the skin ; oppression at the breast, with anxiety, sighing, and moaning ; the thirst is greatly increased ; the tongue, mouth, lips, and teeth are covered over with a brown or black tenacious fur ; the speech is inarticulate, and scarcely

intelligible; the patient mutters much, and delirium arises. The fever continuing to increase still more in violence, symptoms of putrefaction show themselves; the breath becomes highly offensive; the urine deposits a black and foetid sediment; the stools are dark, disagreeable, and pass off insensibly; hæmorrhages issue from the gums, nostrils, mouth, and other parts of the body; livid spots, or petechiæ, appear on its surface; the pulse intermits and sinks; the extremities grow cold, hiccup ensues, and death at last closes the tragic scene.

“ When this fever does not terminate fatally, it generally begins, in cold climates, to diminish about the commencement of the third week, and goes off gradually towards the end of the fourth, without any very evident crisis; but in warm climates it seldom continues above a week or ten days, if so long. Our opinion as to the event is to be formed by the degree of violence in the symptoms, particularly after the appearance of the petechiæ, although in some instances recoveries have been effected under the most unpromising appearances. An abatement of febrile heat and thirst; a gentle moisture diffused equally over the whole surface of the body; loose stools; turbid urine; rising of the pulse; a free secretion of saliva; tumor and suppuration of the parotid, axillary, or inguinal glands; a scabby eruption about the mouth, and the absence

of delirium and stupor, may be regarded in a favourable light. On the contrary, great muscular debility; very difficult and labourious respiration; stupidity and listlessness of the eyes; perpetual writhing of the body; petechiæ, with dark, offensive, and involuntary discharges by urine and stool; fetid and cadaverous sweats; hemorrhages; subsultus tendinum; and hiccups, denote the most certain dissolution of the patient."

Under the head of the Plague, or Pestis, Thomas observes—"The plague is a fever of a putrid and very contagious nature, in the progress of which extreme debility, buboes, carbuncles, petechiæ, hemorrhages, colliquative diarrhœa, and such other symptoms arise." He now quotes the passage, already adduced from Hooper, about the plague being divided into three species, according as it is attended with buboes, carbuncles, and petechiæ, &c., and then goes on to say—

*"Mr. M'Gregor, in his Medical Sketches of the Expedition from India to Egypt, notices, that the plague is subject to several varieties in different seasons and circumstances. In the Indian army, he observed, that when the disease first broke out, the cases sent from the crowded hospitals of the 61st and 88th regiments were from the commencement attended with the typhoid, or low symptoms.*

*Those which were sent from the Bengal volunteer battalion, and from the other corps, when the army was encamped near the marshy ground at El Hammed, were all of the intermittent and remittent type. The cases which occurred in the cold rainy months of December and January had much of the inflammatory diathesis ; and in the end of the season, at Cairo, Ghiza, Baulac, and on crossing the isthmus of Suez, the disease wore the form of a mild continued fever."*

"The plague is by most writers considered as the consequence of pestilential contagion, which is propagated from one person to another by association, or by coming near infected materials.

"Some, however, have doubted whether this disease is really contagious or not. The fact that *it is evidently contagious is fully established in Mr. M'Gregor's opinion ; but the laws of transmission are not more accurately known than the specific nature of the contagion. Dead bodies, we are told, did not seem to convey it ; the heated animal body, and still more with a febrile moisture on the skin, appeared to transmit it most readily. Among the most obvious causes which contribute to induce the plague, besides contagion, may be enumerated the following, viz., corrupt or damaged grain, putrid fish, or other animal substances, noxious exhalations*



*arising from stagnant waters, or slimy mud, a residence in confined situations, where the current of air is obstructed, and the want of due cleanliness.*

“In some eastern countries, but more particularly Persia and Japan, this disease is wholly unknown. In those where it is prevalent, it rages most violently during the summer; its effects are somewhat diminished in autumn; and during the winter it is greatly reduced or totally suppressed. It attacks persons of all ages and both sexes indiscriminately; but women, young people, and infants at the breast, have been observed in general to resist infection more than robust men. Those who were exposed to vicissitudes of heat and cold, such as bakers, cooks, and smiths, were noticed, during the campaign in Egypt, to be more particularly attacked with it.

“The plague is said to be most prevalent in that country soon after the inundation of the Nile, or rather its recession; for a quantity of slimy mud being deposited on the banks of the river, and other places it has overflowed, occasions humid metphitic exhalations to arise, and which are supposed to occasion the disease. From Sir Robert Wilson’s account of the diseases of Egypt, (see his History of the Expedition to Egypt,) there is great reason to suppose that a humid state of the atmosphere is favourable to the production of the



plague; for the English and Turkish armies, which marched to Cairo, escaped contagion, notwithstanding almost every village was infected; while the troops that remained stationary on the moist shore of Aboukir, were severely affected, and lost many men. A dry atmosphere appeared to him, not only to be a preventive of the plague in some degree, but likewise to act as a remedy; for we are told that several men, confined with this disorder in the hospital at Jaffa, escaped into the desert, and endeavoured to reach the army; but finding the attempt impracticable, they returned in three days perfectly recovered."

After again quoting from Hooper, Thomas observes,—“ In no disease do patients bear motion worse than in this. The least motion has been known to induce syncope, and even death, particularly in the last stages of the complaint.” He again quotes from Hooper:—“ The plague is always to be considered as attended with imminent danger, and when it prevailed in this country about two hundred years ago, proved fatal to most of those who were attacked with it. It is probable, however, that *many of them died from want of care and proper nourishment, the infected being forsaken by their nearest friends; because in Turkey and other countries, where attention is paid to the sick, a great many recover.*” He continues,—“ Of

the French army that invaded Egypt, little more, however, than one-third of all that were attacked with the plague recovered, as appears by the report made by M. Desgenettes, (see his *Histoire Médicale de l'Armée de l'Orient*,) who was the chief physician to that army. The duration of the disease is various. *In some instances the effect of the pestilential contagion is the immediate extinction of life; and cases have occurred wherein the patient has survived but a few hours the first sensation of illness. In other instances, again, he has lived till the thirteenth and even the seventeenth day of the disease.*" He quotes again from Hooper:—"When the plague is unattended by buboes, it runs its course more rapidly, and is more generally fatal than when accompanied by such inflammation. The earlier they appear, the milder usually is the disease. When they proceed kindly to suppuration, they always prove critical, and ensure the patient's recovery." He observes, "It is generally a favourable sign when the buboe does not adhere, but shakes on its base." He continues to quote,—“A gentle diaphoresis, arising spontaneously, has been known in many instances likewise to prove critical. When carbuncles show a disposition to become gangrenous, the event will be fatal. Furuncles, petechiæ, hæmorrhages, and a colliquative diarrhœa, denote the same termina-

tion." The worst forms of the disease are always accompanied with the usual symptoms of putridity and malignity; and such rarely terminate favourably. It has been remarked, that if a patient, after an access of delirium, was suddenly restored to his senses, he seldom recovered. Most cases terminate fatally wherein the patient is comatose from the beginning. *The typhomania may be regarded as a more fatal form of the delirium than the inflammatory."*

Under the head of a vomiting and purging, or cholera morbus, Dr. Thomas observes,—“ A frequent and violent discharge of *bilious matter, both upwards and downwards, with painful gripings, constitutes cholera morbus.*”

“ In warm climates it is met with at all seasons of the year, and its occurrences are very frequent; but in *England and other cold climates, it is apt to be most prevalent in the middle of summer, particularly in the month of August; and the violence of the disease has usually been observed to be greater in proportion to the intenseness of the heat.* These circumstances naturally induce us to presume that cholera morbus is the effect of a warm atmosphere producing some change in the state of the bile; which change may consist either in the matter of the bile being rendered more acrid, or its being secreted in a preternatural quantity. In some in-

stances the disease has been observed to proceed from an obstructed perspiration, as likewise from food which has passed readily into the acetous fermentation, from unripe fruit and acrid ingesta ; but these causes, probably, would not give rise to it *without the predisposition acquired by preceding great heat.*

“ It usually comes on with soreness, pain, distension, and flatulency in the stomach, and acute griping pains in the bowels, succeeded quickly by a severe and frequent vomiting and purging of bilious matter, heat, thirst, a hurried respiration, and a frequent but weak and fluttering pulse.

“ When the disease is not violent, these symptoms, after continuing for a day or two, cease gradually, leaving the patient in a debilitated and exhausted state ; but where the disease proceeds with much violence, there arises great depression of strength, with cold clammy sweats, considerable anxiety, a hurried and short respiration, cramps in the legs, coldness of the extremities, and hiccups, with a sinking and irregularity of the pulse, which quickly terminate in death ; an event that not unfrequently happens within the space of twenty-four hours.

“ Cholera morbus is to be distinguished from diarrhœa and dysentery by the matter which is discharged being *pure bile, unmixed with blood or mucus, and with scarcely any admixture of fæces.*

It may be distinguished from colica pictonum by the evacuations; for in the latter, although there is sometimes a considerable quantity of *bilious matter* thrown off by vomiting, yet the bowels remain obstinately costive.

“Our opinion must ever be unfavourable, when the last-mentioned set of symptoms accompany the evacuations upwards and downwards; but when the vomiting abates and sleep ensues, we may expect the patient’s recovery.”

With regard to “the Scurvy or Scorbutus,” Dr. Thomas observes:—“The characteristics of this disease, as affixed by Dr. Cullen, are, debility, bleeding of the gums, spots of different colours on the skin, for the most part livid, particularly at the roots of the hairs, occurring in cold countries, after living on putrescent salted animal food, with a deficiency of recent vegetable matter.

“The scurvy is a disease of a putrid nature, much more prevalent in cold climates than in warm ones, and which chiefly affects sailors, and such as are shut up in besieged places, owing, as is supposed, to their being deprived of a due quantity of acedent food, assisted by the prevalence of cold and moisture, and by such other causes as depress the nervous energy, as indolence, confinement, want of exercise, neglect of cleanliness, much labour and fatigue, sadness, despondency, &c. These several

debilitating causes, with the concurrence of a diet, consisting principally of salted or putrescent food, with foul water, will be sure to produce this disease. It seems, however, to depend more on a *defect* of nourishment than a *vitiated state*; and the reason why salted provisions are so productive of the scurvy is, most probably, because they are drained of their nutritious juices, which are extracted and run off in the brine. As the disease is apt to become pretty general among the crew of a ship, when it has once made its appearance, it has been *supposed* by many to be of a *contagious nature*; but the *conjecture* seems to be by *no means well founded*. The circumstance arises most probably *from the men being alike exposed to the exciting causes of it*." He has been quoting what I have already adduced from Hooper, and he still continues to do so. "A preternatural saline state of the blood has been assigned as its proximate cause. It has been *contended* by some *physicians* that the *primary morbid affection* in this disease *is* a debilitated state of the solids, arising *principally from the want of aliment*."

Thomas says, "Various theories have indeed been advanced with respect to *scurvy*. By *Sir John Pringle* it has been supposed to be owing to the putrescency of the blood. By *Dr. Lind*, *Dr. Blane*, and *Dr. Millman*, it has been looked upon,



as a disease of *debility*, having *its origin* in the *weakness of the organs of digestion*, or in the *gradual diminution of the vital power*, by the *remote causes* ; or it is rather owing to a defect of *nourishment* than to a *vitiated state of it*." Dr. Trotter, reasoning from the experiments of Dr. Goodwin concerning the action of the dephlogisticated air on the blood, infers that the black colour of this in scurvy is owing to the abstraction of this principle, (dephlogisticated air or oxygen,) and that *fresh vegetables* cure the disease by *restoring* to the blood *this lost principle*. Dr. Beddoes supposes scurvy to be owing to a gradual abstraction of oxygen from the *whole system*, just as death is produced in drowning, by withholding all at once the same substance from that blood which is to pass the posterior cavities of the heart. Of the two causes of scurvy, want of *fresh vegetables*, or want of *air sufficiently furnished with oxygen*, Dr. Beddoes thinks the *latter* is by far the *most powerful*. Captain Cook's *unexampled success* in *preserving* his crews from the scurvy during his *two last voyages*, seems to have been owing in a great measure to his *extreme care* in keeping every part of the *ship well ventilated*. The crew on many occasions were *reduced* to *salt provisions*, and *much longer* out of *sight* of the *land* than many other *ships* which have been *dreadfully afflicted*

with the *scurvy*. In his *last* voyage, there did *not* appear among the men any symptom of this disorder; and in his *second* only one had it in any considerable degree.

“ The *scurvy* comes on gradually, with *heaviness*, *weariness*, and *unwillingness* to move about, together with *dejection of spirits*, *considerable loss of strength*, and *debility*. As it advances in its progress, the *countenance* becomes *bloated* and *sallow*, *respiration* is *hurried* on the *least motion*, the *teeth* become *loose*, the *gums* are *spongy*, the *breath* is *very offensive*, *livid spots* appear on *different parts* of the *body*, *old wounds* which have been *long healed up* break out *afresh*; *severe wandering pains* are *felt*, particularly at *night*; the *skin* is *dry*; the *urine* small in quantity, *turning blue vegetable* infusions of a *green* colour; and the *pulse* is *small*, *frequent*, and towards the *last*, *intermitting*; but the *intellects* are for the most part *clear* and *distinct*. In some cases of *scurvy*, and even in its *incipient state*, *nyctalopia* (night vision) has been observed as one of the *attendant symptoms*. (See Dr. Blane’s [Sir Gilbert] work on the Diseases of Seamen.) By an aggravation of the symptoms, this disease, in its last stage, exhibits a most wretched appearance. The *joints* become *swelled* and *stiff*, the *tendons* of the *legs* are *rigid* and *contracted*, *general emaciation* en-

*sues, hæmorrhages break forth from different parts, fetid evacuations are discharged by stool, and a diarrhœa or dysentery arises, which soon terminates the tragic scene.*" For some few passages back, Dr. Thomas has been quoting from Dr. Hooper, and he continues to do so ; but as I have already, myself, quoted from that author, I shall only state what I have not added from Hooper. " In forming our judgment as to the event of the disease, we are to be directed by the violence of the symptoms, by the situation of the patient with respect to a vegetable diet, or other *proper substances*, by his former state of health, and by his *constitution* not having been *impaired by previous disorders.*"

Any one who has read the accounts given by Hooper and Thomas, of the symptoms, causes, and prognosis of the preceding diseases, must, unless the veil of prejudice shroud his moral vision from the perception of truth, at once perceive, if not the perfect identity, at least, the *very great similarity* of yellow fever, typhus fever, plague, cholera, and sea-scurvy. And if there should be found any such unfortunate person, I am sorry I cannot help him ; for, as I believe Dr. Johnson said, " I only undertake to furnish facts, (or arguments,) I cannot find brains. But before I proceed to draw my conclusions as to the contagious nature, proximi-

mate cause, and proper treatment of those diseases, I must beg leave to trespass on the reader's attention while I adduce the evidence afforded by post-mortem examinations as to their *identity*.

Post-mortem examinations, in persons who have died of yellow fever, give the following results, according to Thomas:—"The coats of the œsophagus are found to be corroded; the stomach and intestines loaded with a black foetid matter, or both to be often much inflated, inflamed, and sphacelated; the liver, in many cases, to be shrunk to less than half its natural size, very flaccid, and of a colour approaching to buff; and the gall-bladder to be flaccid and greyish, having but little bile contained in it. In some instances, the lungs have been found inflamed; and the bladder has been observed to be much thickened, and to contain a considerable quantity of urine. In those cases where there has been a discharge, by vomiting, of a *black coagulated* matter resembling the grounds of coffee, the gall-bladder and biliary ducts have been found distended with the same substance."

According to the "Nova Elementa ad Nasographiæ—Philosophicæ norman exarata tyronumque usui accommodata, auctore Josepho Capuron, Doctore Medico Parisiensi," &c. &c., published at Barcelona 1834, the results of post mortem examinations of subjects dead of this fever are reported as

follows—"Sectis defunctorum cadaveribus, observari solent ventriculi, duodeni, intestinique tenuioris erotio, solito major mucosæ quâ hæc organa inducuntur membranæ crassities; nunc mucus et bilis, nunc sanguinis coagula aut materies obscura, fusca, nigra ventriculo contenta; hepar sæpè ut sanis, aliquandò, raro tamen, solitâ mole majus, rubrum, inflammatum, suppurans; lien durus; livius, quasi putridus; interna vescicæ superficies aliquandò rubra aut tabida, sub obscura sanguineo lotio plena; pleura, pericardiumque sero vel sanguine distenta; pulmones sanguine turgidi, inflammati, suppurantes, gangrænâ vitati; cor vacuum, pallidum, flaccidum; ipsius auricula dextra ut sanis; hæc organa aliquandò nigro, crasso, coagulatoque sanguine, vel polyposâ concretionem referta; calvaria sanguine obruta."

Under the head of putrid and malignant, or Typhus Gravior, Dr. Thomas says—"The appearances usually perceived on dissection are, inflammations of the brain and viscera, but more particularly of the stomach and intestines, which are now and then found in a gangrenous state. In the muscular fibres there seems likewise a strong tendency to gangrene."

Under the head of Febris atacta remittens seu perniciosa, Capuron, in the work already cited, remarks—"Secta defunctorum cadavera varias ence-

phali læsiones ostendunt; nunc scilicet laterales sinus, aliave cerebri latibula sero plena; nunc meningēs inflammatas, opacas, crassas, concretâque materiâ obductas; nunc injecta vasa cerebralia; nunc deniquè encephalum solito densius: indè nervorum compressio, œconomix tumultus, mobilitatis anomalix, cæteraque phænomena quibus atactæ febres stipari solent."

Under the head of the Plague, or Pestis, Thomas says—"Dissections of the plague have discovered the gall-bladder full of *black bile*, the liver very considerably enlarged and diseased, the heart much increased in size, and the lungs, kidneys, and intestines beset with carbuncles. They have likewise discovered *all the appearances of putrid fever*, with the *blood black* and *loose* in its *texture*. In many instances, the *glandular system* has been found in a very *diseased state*."

Under the head Febris adeno-nervosa-continua vel Pestis orientalis, Capuron gives no anatomical results; but he states—"Commendatissimi et ferè innumeri auctores sive historici, sive medici de peste scripserunt; nimirum Thucydides, S. Cyprianus, Evagrius, Nicephoras, Zonaras, Fallopius, Forestus, De Mertens, aliique complures quorum nomina hic enumerare prolixius esset.

"Causæ prædisponentes. Corporis habitus physico influxu, moralive affectu debilitatus, ut apud



eos observatur qui baccho aut veneri nimium indulgent, pervigilant, labore franguntur, curis exeduntur, ipsiusque petis terrore incutiuntur. Causæ efficientes. Miasmata vel contagia, *quorum natura subtilis perspicacissimam tum physicorum tum chimicorum indaginem fugit*; quorum tamen sequentes noscuntur proprietates: 1<sup>o</sup>, ex infectorum corporibus emanant; ii.<sup>o</sup> ipsorum vestimentis, adhærent; iii.<sup>o</sup>. filo, pilo, telæ lanæque facile communicantur; iv.<sup>o</sup>. immersione in acetum, crebo fumigio, diuturnoque æris contactu obtunduntur aut dissipantur."

"De febre adeno-nervosâ remittente aut intermittente," he says—"Febris adeno-nervosa remittens nondum observatione constat. Doctor Bertrand, cum pestis Massiliæ grassaretur, se febrem intermittentem observasse memorat sequentibus stipatam phænomenis: accessus scilicet eadem quotidie horâ revertebantur; ab exordio extrema leviter horrebant; mox elapsis quatuor aut quinque horis, gravissima symptomata sæviebant, calor vehemens, &c.; tandem secundus tertiusve accessus ægris enecabat. An febris illa ad intermittentes atactas, an ad pestem referenda adhuc sub judice lis est." I speak confidently, and say it is referrible to both; for the one is a variety of the other.—Auctor.

With respect to the results of post-mortem exa-

minations in subjects who have died of the scurvy, Dr. Thomas remarks—"Dissections of scurvy have always discovered the *blood* to be in a *very dissolved state*. The *thorax* usually contains more or less of a *watery fluid*, which in many cases possesses so high a *degree* of *acrimony* as to excoriate the hands by coming in contact with it. The *cavity of the abdomen* contains the same kind of fluid. The *lungs* are black and putrid; and the *heart itself* has been found in a similar state, with its cavity filled with a corrupted fluid. In many instances the epiphyses have been found divided from the bones, the cartilages separated from the ribs, and several of the bones themselves dissolved by caries. The brain seldom shows any marks of disease."

Under the head of Cholera Morbus, both Hooper and Thomas state, that "the appearances generally to be observed on dissection, where cholera terminates fatally, are an accumulation of bile in the stomach and intestines, particularly in the duodenum; relaxation and distention of the biliary ducts and choledochus, and a removal of many of the viscera from their proper places, occasioned probably by the violence of straining in vomiting."

Under the head of "Colica—the colic, or belly-ache" Hooper observes—"The appellation of colic is commonly given to all pains in the abdomen, almost indiscriminately; but, from the different

*causes and circumstances of this disorder, it is differently denominated, and nosologists and medical writers have very much multiplied the species, and formed them into several genera.* When its principal symptoms are sharp and spasmodic pains, it is called spasmodic colic; and when with the pain there is constipation, and much fæcal matter is purged off, stercoraceous colic; when from indigestible food, *accidental colic*. When the pain is accompanied with a *vomiting* of *bile*, or with obstinate costiveness, it is called a *bilious colic*; if flatus causes the pain, that is, if accompanied with temporary distension, relieved by the discharge of wind, it takes the name of flatulent, or windy colic; when accompanied with heat and inflammation, it takes the name of inflammatory colic, or *enteritis*. When this disease arises to a violent height, and is attended with obstinate costiveness, and an evacuation of fæces by the mouth, it is called *passio iliaca*, or iliac passion.

“1. Of Spasmodic Colic.—*This species is attended by pain about the navel, with a retraction of the parietes of the belly.* The pain goes and returns, and moves about as in other kinds of colic, but there are more perfect periods of ease. When the belly is soft, the *intestines* are often felt in *lumps*, which move about under the hand, or wholly vanish for a time. *These* are its *essential characters*, and

*establish the purely spasmodic affection* when there is *no flatulency*, nor *acrid substances* in the bowels, nor any of the *distinctive symptoms* of the *other species*. This species occurs in *highly nervous* and *hysterical constitutions*, and is *relieved* by *stimulating fomentations*, *warm clysters*, and *carminatives*, *especially* the compound spirit of *sulphuric æther* with *camphor*. If these do not remove the spasms, *opium* is an almost *infallible remedy*."

"3. Of the Bilious Colic.—The pain is *seldom continued*, or *so severe* as in the *purely spasmodic species*: it is more *transient*, and is accompanied by *constipation*, *nausea*, and *vomiting*; and great *relief* is obtained by *pressure* on the belly. That which passes from the stomach is bilious; and when the bowels are opened, the fæcal discharge is *very bilious*, and the *fæces* often *very dark coloured* and *offensive*. The remedies for this kind of colic are, *submuriate of mercury*, with *colocynth*, *aloetic*, and *saline purges*, in *active doses*, and the use of *fomentations*."

Having adduced so much evidence to prove the essential identity of the foregoing diseases, I shall now offer a few observations in support of my thesis.

And, 1st. It must be manifest to all who have read the evidence, that, although their general symptoms and properties are essentially the same; yet

that there are many varieties of each individual affection ; and, therefore, that the symptoms vary according to the particular variety of the disease. This will account for the variety of the symptoms, which, though essentially the same, occur in those diseases, or (to speak more properly) in those varieties of the same disease.

2nd. That a modification of the predisposing cause or causes will give rise to modifications of temperament in the patients, which will account for the varieties observed in diseases essentially the same.

3rd. That yellow fever, typhus fever, plague, cholera, and sea-scurvy, being varieties of a disease essentially the same, and depending on a cause (however it may vary in form) essentially the same, the symptoms attributed to one variety, under ordinary circumstances, will be noticed in the other varieties, under extraordinary circumstances. And this we find to be the case ; for there is no one symptom or property of yellow fever which has not, under certain circumstances, been attributed to plague, and *vice versâ*. Neither is there any symptom of typhus fever, which has not occasionally been attributed to sea-scurvy, and *vice versâ*. Moreover, the apparent differences that exist between the scurvy, typhus fever, and epidemic European cholera, and the yellow fever, plague and intertropical epi-

demical cholera, cæteris paribus, are to be attributed to the influences of climate and other adventitious circumstances, modifying the predisposing cause.

4th. That the appearance of pure bile in any of those disorders is a favourable sign, and that this takes place in all mild cases of each variety of the disease; the restoration of the biliary secretion being an essential condition of recovery in them all.

5th. That in the graver cases of typhus fever, yellow fever, plague, cholera, and sea-scurvy, there is no bile secreted,—this secretion being replaced by a dark or black vitiated secretion from the relaxed debilitated capillaries of the liver, called by authors not bile, but *bilious matter*.

6th. That this *bilious matter* is not the matter of black vomit, described to be like coffee-grounds, which is ejected in the last stage of yellow fever—attended with symptoms of great arterial action and terminating fatally; this matter not being a vitiated secretion from the liver, but the result of the over-excited extremities of the capillaries of the mucous membrane of the stomach, liver, pancreas, and probably of the duodenum and dejunum, suddenly giving way before the general commotion, existing in the arterial system, and affording a beautiful illustration of a critical evacuation terminating fatally. This is similar to what takes place when a critical sweat breaks forth on the surface of the body, under cir-



cumstances of great arterial action, putting a period to the attendant fever. The one, however, is a salutary crisis, the other fatal.

This view of the case is strengthened by the fact that it is not an unusual thing for the extremities of vessels to relax under circumstances of great previous excitement,—witness the sphincters of the bladder and rectum in the last struggles of convulsions, and frequently of death,—witness the biliary ducts in some fatal cases of cholera, wherein the bile, previously suppressed, is abundantly poured forth *in articulo mortis*. In such cases, the author has been standing beside a patient's bed, feeling his pulse, when all of a sudden, the unfortunate man has ejected from his stomach, with the velocity and power of a force-pump, a quantity of liquid matter, dark as ink, deluging him from head to foot; soon after which, all symptoms of arterial action ceasing, the patient has quietly expired, apparently in the full possession of all his senses. In such cases no secretion of bile took place during the disease, nor any substitute for it, from the liver; but after death, the skin of the defunct presented a pale, yellow tinge; the result, no doubt, of the retention of the elements of the bile in the system.

7th. That in fatal cases of spasmodic, Asiatic, or epidemic cholera, there is no bile secreted, which is also the case in the most fatal cases of yellow fever—

attended with reaction, plague, cholera, and sea-scurvy. In the first case, however, the bile is replaced by a morbid secretion from the stomach, liver, and other chylopoietic organs, resembling rice-water, or the washings of raw meat ; in the second, by a matter resembling coffee-grounds diffused in water ; in ordinary cases of typhus terminating fatally, by the *black bilious matter* already referred to ; and in *fatal cases of sea-scurvy, there is no secretion at all from the liver, but dissection shows "the cavity of the thorax, and the cavity of the abdomen, to contain a more or less watery fluid, which in many cases possesses so high a degree of acrimony, as to excoriate the hands by coming in contact with it, and the blood is always discovered to be in a very dissolved state."*

8th. That the cause of yellow fever, typhus fever, plague, epidemic cholera, and sea-scurvy, however it may vary in form, is essentially the same ; and the author concludes, in respect to the whole of them, with Dr. Beddoes in regard to scurvy, that they " are owing to a gradual abstraction of oxygen from the whole system, just as death is produced in drowning, by withholding all at once the same substance from that blood which is to pass the posterior cavities of the heart." He also thinks, in reference to those disorders, with Dr. Beddoes in reference to scurvy, that, " of the two" formal " causes of scurvy,

want of fresh vegetables, or want of air sufficiently furnished with oxygen, the latter is by far the most powerful." Now, the formal causes assigned to the yellow fever are, "the climate of the West Indies and America; hot and dry sultry weather; male sex; intemperance; depressing passions of the mind; *contagion produced from the effluvia of putrid animal and vegetable substances*; recent exhalations acted on by a vitiated state of the atmosphere, and long-continued dry and sultry weather." Those assigned to typhus fever are, "weak and delicate habit of body, accompanied with much sensibility and irritability; studious and sedentary life; depressing passions of the mind; poor living; too free indulgence in the use of enervating liquors; excess in venery; profuse evacuations; warmth of climate; intemperance; exposure to cold, united with moisture; grief; fear; anxiety; those causes which in constitutions so predisposed, would induce synocha, contagion." In regard to the causes of the plague, Hooper observes, "The plague is by most writers considered as the consequences of pestilential contagion, which is propagated from one person to another by association, or by coming near infected materials;" which observation Thomas repeats, *ipsisimis verbis*, without even acknowledging from what source he got it; but which appears to be a mere prejudice, resting on no solid foundation;—

for (admitting the contagious nature of the plague, in the same sense as that of typhus fever, yellow fever, cholera, and sea-scurvy, which no sensible man will deny,) it does not attempt to offer the slightest explanation of the causes which *originate* this disorder. Thomas, however, goes on to say (as has already been stated,) “ In some *Eastern countries*, this disease is *wholly unknown*. In those where it is prevalent, it *rages most violently during the summer* ;” mark the expression and compare it with what Sydenham said of cholera ; “ its effects are *somewhat diminished* in autumn, and during the winter it is greatly reduced, or totally suppressed.” This is precisely what takes place in the West Indies, in reference to the inflammatory species of the yellow fever ; and if the fever is not altogether suppressed as the weather gets cooler, it assumes the typhoid type. In England, however, typhus fever is found to succeed cholera as winter advances. Thomas continues, “ It attacks persons of all ages and both sexes indiscriminately, but *women, young people, and infants at the breast*, have been observed in *general*, to resist infection more than *robust men*. Those who were exposed to the vicissitudes of heat and cold, such as bakers, cooks, and smiths, were noticed, during the campaign in Egypt, to be more particularly attacked with it.” This is precisely

what takes place in reference to typhus fever, yellow fever, and cholera. Thomas continues,

“ The plague is said to be most prevalent in that country soon after the inundation of the Nile, or rather its recession ; for a quantity of slimy mud being deposited on the banks of the river, and other places, it has overflowed, occasions humid mephitic exhalations to arise, and which are supposed to occasion the disease.” This is just what the generality of the American writers say about the *origin* of the yellow fever in New York and Philadelphia. (See the evidence already adduced.) I shall here conclude what I have to say of the contagious nature of those diseases ; and what I say on this subject, in reference to the plague, will apply with equal force to the yellow fever, typhus fever, cholera, and sea-scurvy. Now, as I think it has been shown, that there is an identity of essence, both as to cause and effect, in those disorders ; what is true of one, will, also, be true of the other, and *vice versâ*. If, therefore, the mass of evidence be in favour of the contagious nature of the plague, it will, also, establish that of cholera, yellow fever, typhus fever, and sea-scurvy and *vice versâ*. Let us now proceed to judgment.

What say the witnesses ? Mr. M'Gregor (in his “ History of the Expedition to Egypt ”) called and sworn, deposes, that, in his opinion, “ the fact that

the plague is *evidently* contagious is fully established ; but that the *laws* of *transmission* are not more *accurately known* than the *specific nature* of the *contagion*." Dead bodies, he adds, did *not* seem to *convey it* ; the *heated animal body*, and *still more* with a *febrile moisture* on the skin, appeared to *transmit* it most readily. But he adds, among the *most obvious causes* which contribute to induce the plague, besides contagion, are corrupt or damaged grain, putrid fish, or other animal substances, noxious exhalations arising from stagnant waters or slimy mud, a residence in *confined situations* where the current of air is obstructed, and want of due cleanliness. The judge notes—This is no more than what is generally true of typhus fever, yellow fever, cholera, and sea-scurvy ; but, he adds, they are universally acknowledged to be contagious, under certain circumstances.

Dr. Rush (under the head of yellow fever) deposes, " that it is *not* contagious in its *simple state*, and that it spreads *exclusively* by means of *exhalations* from *putrid matters*, which are *diffused* in the *air*." The judge again notes, This mainly accords with what Mr. M'Gregor says of plague.

Neither Thomas nor Hooper says anything important about the contagious nature of the cholera or scurvy, but they attribute them to the same general causes as the plague, typhus fever, and yellow



fever ; nor are (the author believes) those diseases considered contagious in the countries where they are most prevalent.

On the whole, therefore, the author concludes that the plague, yellow fever, typhus fever, cholera, and scurvy, are contagious in the same degree—that is, they are *not contagious* in the sense in which they are vulgarly supposed to be so. Further, he is of opinion, that those disorders are only contagious or (to speak more properly) infectious, when they occur in densely-populated, ill-ventilated localities, among filthy, ill-fed, intemperate subjects, who are deprived, from whatever cause, of a due supply of fresh vegetable aliment, and properly oxygenated air, either on shore or at sea. From which, and from what has already been said in this treatise, he concludes, that the existence of quarantine laws is oppressive to individuals, useless, if not injurious to society, and a shame and a disgrace to any enlightened country ; for there is no more danger of the typhus fever or scurvy being conveyed, by the bodies of men, or packages of merchandise, from England to the West Indies, or to India and the Levant, than that the yellow fever, the Asiatic cholera, or the plague, will be brought to England, by the same means, from any of the countries in which they are endemically or epidemically prevalent. But the same causes will produce the same results

in whatever part of the world they prevail, and among men of the same habits and disposition, however styling themselves.

I shall now continue (after so long a digression) to review the formal causes attributed to the foregoing disease, in order to prove my opinion respecting their *one-essential-cause*. To proceed, then : the causes attributed to cholera, as already stated, are, excessive heat, or sudden transitions from heat to cold ; hence more frequent in autumn, from an exposure to cold evenings after very hot days ; food of difficult digestion ; rancid butter ; the colder fruits, such as cucumber, melon, &c. ; active and violent purgatives ; poisons ; violent passions of the mind ; marsh miasma. “ *Proximate cause, inordinate secretion of bile of a vitiated quality?*” The causes of scurvy are as follows :—Defect of nourishment ; diet of salted or putrescent food, with *deficiency of vegetables* ; want of cleanliness ; cold, united to moisture, or the *transition* from a *warm* to a *cold* temperature ; want of exercise ; depressing passions of the mind.

Now it will be evident to any competent judge of such matters, that the causes above enumerated, are of two kinds, the ordinary exciting causes of all simple diseases, viz. 1st, sudden transitions from heat to cold, and *vice versâ*, irritating substances applied to the stomach, bowels, and other parts of

the body, and irregular passions of the mind ; and 2ndly, those causes which concur in inducing a depraved state of the system. But the depravity of the system is effected by first corrupting the blood, which *Unerring Truth* declares to be the *Life* of the animal. This is effected, as I believe I have already shown, by the gradual abstraction of oxygen from the system—generally, in consequence of meteoric changes affecting the constitution of the atmosphere, and the growth of vegetables, which constitute the ordinary and necessary food of man. In order to make this subject plainer to the unlearned, I shall quote what Hooper says under the head of Oxygene. (“Oxygenium, from οξυς, acid, and γεννᾶω, to generate ; because it is the generator of acidity.) This substance, although existing sometimes in a *solid*, and sometimes in an aëriform state, is never *distinctly perceptible* to the *human senses* but in combination. We know it only in its combination by its *effects*. Nature never presents it *solitarily*—chemists *do not know* how to *insulate* it. It is a *principle* which was *long unknown*. It is *absorbed* by *combustible bodies*, and *converts* them into *oxydes* or *acids*. It is an *indispensable* condition of *combustion*, *uniting itself always* to *bodies which burn*, *augmenting their weight* and *changing their properties*. It may be *disengaged* in the state of *oxygen gas*, from *burnt bodies*, by a *joint accumula-*

*tion of caloric and light.* It is highly *necessary* for the *respiration of animals.* It exists *universally dispersed through nature,* and is a *constituent part* of the *atmospheric air,* of *water,* of *acids,* and of *all bodies* of the *animal and vegetable kingdoms.* One of the most *remarkable combinations* into which it is capable of entering is that which it forms with *light and caloric.* The nature of that *mysterious union* has not been ascertained; but it is *certain* that, in *that state,* it constitutes the *gaseous fluid* called *oxygene gas.*

“ *Properties of oxygene gas.*—Oxygene gas is an elastic *invisible* fluid, like common air, capable of *indefinite expansion* and *compression.* It has *neither taste nor odour,* nor does it show *any traces* of an *acid.* Its specific gravity, as determined by Kirwan, is 0·00135, that of water being 1·0000; it is, therefore, 740 times lighter than the same bulk of water. Its weight is to atmospheric air as 1103 to 1000. One hundred and sixteen cubic inches of oxygene gas weigh 39·38 grains. It is not absorbed by water, but is entirely *absorbable* by combustible bodies, which, at the time, *disengage* its *caloric and light,* producing in consequence a *strong heat and flame.* It rekindles *almost extinct combustible bodies.* It is indispensable to *respiration,* and is the *cause of animal heat.* It *hastens germination.* It *combines* with *every combustible body,* with *all the*

*metals* and with the *greater number* of *vegetable* and *animal substances*. It is considered as the cause of acidity ; and from this last property is derived the name oxygene, a word denoting the *origin* of *acidity*. The act of its combining with bodies is called oxidisement, or oxygenation ; and the bodies with which it is combined are called oxides or acids. Oxygene gas is the chief basis of the *pneumatic doctrine* of chemistry.

“ Methods of obtaining oxygen gas.—We are at present acquainted with a *great number* of *bodies* from which we *may, by art*, produce *oxygen gas*. It is most *amply* obtained from the oxides of *manganese*, *lead*, or *mercury* ; from *nitrate* of potash, from the *green leaves* of *vegetables*, and from oxychlorate of potash or soda. Besides these, *there* are a *great many other substances* from which *oxygene may be procured*. Oxygene gas may be *obtained* from the *green leaves* of *vegetables*. For this purpose, fill a bell-glass with water, introduce *fresh-gatherd green leaves* under it, and place the bell or receiver, inverted in a vessel containing the same fluid ; expose the apparatus to the rays of the sun, and *very puré oxygene gas* will be *liberated*. The *emission* of *oxygene gas* is in *proportion* to the *vigour* of the *plant* and the *vivacity* of the *light* : the quantity differs in *different plants* and *under different conditions*.

“ Explanation.—It is an established fact, that plants

decompose *carbonic* acid, and probably *water*, which serve for their nourishment ; they absorb the hydrogen and carbon of these fluids, disengaging a part of the oxygene in a state of *purity*. *Light*, however, *favours* this decomposition greatly : in proportion as the oxygene becomes disengaged, the hydrogen becomes fixed in the vegetable, and combines, partly with the carbon, and partly with the oxygene, to form the oil, &c. of the vegetable." From which the author concludes that excessively wet and cloudy weather, and long continuance of very hot and dry weather, are equally unfavourable to animal and vegetable life ; and that such events, must have their consequences. Wherefore, looking to the very mild, wet and cloudy weather, which prevailed during last winter, the cold and gloomy spring, which succeeded, and the extremely hot weather, which we have just past, and the very wet and cloudy weather, which we are now experiencing, together with the great scarcity of vegetables, which prevails, the author confidently predicts a dreadful visitation of the cholera at the close of summer, or the beginning of autumn, most likely, in the month of August, to be succeeded by a desolating outbreak of typhus fever. He, moreover, predicts that those who will fall victims to these diseases are the *very highest* and the *very lowest* classes of society—those who, in consequence of their imprudence and profligacy,



have induced want and starvation, with its accompanying miseries; and those who, in consequence of their avarice, gluttony, intemperance, and inhumanity, have induced an unhealthy-plethoric state of the system, coupled with an *uneasy conscience*. The author thinks he could go farther, and point out some of the very individuals on whom this judgment will fall; but he forbears, leaving *secret things* to the *All-wise Judge* and *Disposer* of all *events* both in heaven and earth.

A few words will include what I have to say on the treatment of those disorders. As they all depend on a deficiency of oxygene in the blood, it is evident, that those means, which have a tendency to counteract that state, will be the most efficacious. Of this class are, calomel, muriate of soda, nitrate of potash, the vegetable and mineral acids, especially muriatic and nitro-muriatic acids, the warm and cold baths, warm and cold acescent drinks, whey, acescent wines, cyder, beer, ale, porter, stout, occasionally brandy, gin, whisky, sponging the surface with hot or cold vinegar and water, and occasionally rubbing the surface with hot vinegar and mustard, sometimes opium: the warm essential oils, camphor, bark; quinine, bitter infusions generally, laxatives, neutral salts, saline draughts, sudorifics, &c. It is very questionable whether bleeding ever does good in these disorders except as a

derivative, accompanied with stimulants in the gravest cases of collapse, or as a preparative to the employment of more efficacious means, in cases attended with violent arterial action ; which cases are generally sufficiently well combatted either by the warm bath or cold affusions. Epispastics and other counter-stimulants, (in which class I include leeches,) are of the greatest utility in the stage of collapse. Fumigation with the vapours of nitric and muriatic acids, are of the utmost service, and should never be neglected in poor, densely-inhabited dwellings, or other crowded habitations occupied by the sick, and even by the healthy, in sickly times. Yeast is an old remedy of great efficacy, which has fallen into disuse ; but in such disorders as I have been considering, it promises to be of the greatest utility. The diet of patients affected with these disorders, should consist of farinaceous decoctions or paps, according to circumstances, and, sometimes, even bread, toast, or sweet biscuits, may be allowed, if desired by the patient. As soon, however, as the system has undergone a change, it will be proper to allow animal food—at first, decoctions of the white meats, then the meats themselves, and acescent and preserved or acid fruits. Throughout the whole course of these disorders, the utmost attention should be paid to changing the patients' linen and bed-clothes frequently, and to removing

from the sick chamber, all the egesta, as soon as separated from the system.

Let us now take a glance at the *modus operandi* of the principal agents employed in the cure of these disorders. In the first place, calomel taken into the stomach, is digested, and carried into the circulating mass, like other ingesta. It then, in the course of circulation, decomposes the water of the blood, appropriating to itself its hydrogen, and part of its oxygene, becoming muriate of mercury, a substance well known for its activity on the skin, kidneys, and liver; but the remaining part of its oxygene enters into combination with the blood, converting it into a fluid capable of sustaining the operations of life, and of repairing the continual waste of the system. On the other hand, the redundant ammoniacal and carbonaceous matter present in the blood, is carried off by the skin, kidneys, and the liver. Thus much for the operation of calomel. And common salt acts much in the same manner. Muriatic acid, on the other hand, directly combines with the ammonia of the blood, and passes off much in the same way as the muriate of mercury, already alluded to, carrying the redundant carbon with it. Nitric acid, nitrate of potash, and the vegetable acids, not only supply oxygen to the blood, but they act as direct stimulants to the skin, liver, and kidneys, thus enabling

them to throw off the impurities of the system. Brandy, gin, whisky, the essential oils, and opium, act only as strong stimulants in the stage of collapse, or to assuage intense pain, and are only serviceable when followed up by, or combined with, more efficacious remedies. But it is probable, that camphor, bark, quinine, the bitter infusions, the warm-bath, cold-bath, cold and tepid affusion, ablution with vinegar, or vinegar and water, and fumigations, act all on the same principle, viz., by supplying oxygene to the blood. The neutral salts, saline draughts, laxatives, and sudorifics, act only as simple evacuants in eliminating the impurities of the body.

Thus I have been enabled, in the course of a few days, to accomplish the second part of my work, which completes it, however imperfect the execution ; for which I heartily thank God.

NOTA BENE.

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It is observed, in diseases attended with a bad habit of body, and in very hot weather, that both the urine, and the perspiration, run readily into the putrefactive fermentation. This is owing to the presence of an excess of carbon and ammonia in the blood, the result of the extreme rarefaction of the air, and of a deficiency of watery vapour in its composition or (to use the expression of the old writers) its constitution.

I shall endeavour to prove this proposition by showing—

1st. That healthy blood contains free soda, the result of the decomposition of the common salt consumed in ordinary diet.

2nd. That the chlorine of the salt, unites with part of the hydrogen of the watery vapour of the air, to form muriatic acid.

3rd. That the muriatic acid so formed, combines with the ammonia; which results from the nitrogen of the air entering into combination with

the remaining part of the hydrogen of the watery vapour.

4th. That the oxygen of the air, combines with the redundant carbon of the blood, and passes off in the form of carbonic acid gas.

5th. That the muriate of ammonia formed in the manner just pointed out, keeps up an active secretion from the kidneys, the liver, and the skin ; which has a further tendency to purify the blood.

In this manner, under ordinary circumstances, is the blood kept in a state of purity, and fit for ministering to the operations of animal life.

But if anything should interfere with a due supply of the substances now alluded to, the blood, (which naturally abounds in carbon and the elements of ammonia, besides containing oxygen and hydrogen) soon becomes corrupt, and unfit for sustaining the operations of life.

In which case, not only the urine, the perspiration, and the biliary secretion, but also the breath exhale the vapours of carbon and ammonia, (carburetted hydrogen and nitrogen ;) which are known to be most deleterious to animal existence.

These vapours, the author is sure, are what constitute the long unknown elements of contagion,—a fact established, in his opinion, with the power of demonstration ; since it is found that oxymuriatic acid gas, is the most powerful agent in destroying



contagious matter, and purifying the air of impure infected places.

The chemical process which takes place in such cases, is as follows: — Take two parts of muriate of soda, (chloride of sodium,) and one part of black oxide of manganese; mix and place them in an open vessel in the infected chamber; then pour upon the mixture, two parts of sulphuric acid.

*Explanation.*—The water of the sulphuric acid, immediately becomes decomposed. Its oxygen combines with the sodium of the salt, forming soda, with which the pure sulphuric acid combines, to form sulphate of soda or Glauber's salt; whilst the chlorine of the salt, combines with the hydrogen of the water, forming muriatic-acid vapours, which combine with the vapours of ammonia, to form the vapours of muriate of ammonia; which are salutary. The oxygene of the oxide of manganese being disengaged by the heat attending these chemical changes, enters into combination with the carbonaceous vapours, to form carbonic acid gas.

The author is of opinion that the substance called bichlorate of soda (but which he thinks is the bichloride of sodium) acts in a similar manner in the purification of infected places.

## APPENDIX.

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“Whatsoever thy hand findeth to do, do it with thy might ; for there is no work, nor device, nor knowledge, nor wisdom in the grave, whither thou goest.”—*Eccles.* ix. 10.

*To the Humane Public, and to the Honourable  
Members of the Medical Profession.*

DEAR FRIENDS,—It has been reported, that the cholera has already declared itself in some of the thickly populated localities of this immense metropolis. Whether this is really the fact I cannot say ; for living, as I do, apart from the operations of public life, I become acquainted with few of the passing events from personal observation ; but having heard this circumstance stated by one whom I consider to be worthy of credit, I have no difficulty in be-

lieving it. And I am the more inclined to credit such a statement; because my reason informs me, that a similar visitation, is not unlikely to take place, from the scarcity of fresh vegetable aliment, which the poor, in some districts of this kingdom, must have experienced, in consequence of the partial failure of the potato crop; which, I believe, happened last year. Besides, the extremely mild winter which we have passed, and the cold damp and changeable weather which has since occurred, make it amount almost to a certainty, (if there is any confidence to be placed in the uniform operation of natural causes,) that we shall be visited, during some part of this year, with a malignant disease. Thus Hippocrates, that acute and correct observer of nature, justly styled the Father of Physic, says in his 8th aphorism, section third.—“If at the usual times [of the year], the seasons recur regularly, diseases are usual and well judged [i.e. mild]; but if they [i.e. the seasons] recur at unusual periods [of the year] the diseases [of the year], are irregular, and judged with difficulty [i.e. severe or malignant].”

The meaning of this aphorism appears to be, that if spring weather occur in winter, winter in spring, autumn in summer, or *vice versâ*, we are to expect, as a natural consequence of such extraordinary weather, to be visited in spring or autumn, if not in winter or summer, with some malignant

disease. And this observation of the venerable ancient, is found to be correct by the general experience of mankind.

In reference to the changeable weather which we have very lately experienced, and are still experiencing, the same author says in his 4th aphorism, section 3rd—"In the seasons, when, on the same day, it is, indeed, at one time hot, but at another cold, autumnal diseases are to be expected." If this be truth, it is very likely that we shall be immediately visited by a very aggravated flux, which the cholera is universally allowed to be.

But the Asiatic cholera is supposed to depend on some cause or causes, other than the vicissitudes of the weather. And at one time, when its ravages in India were very excessive, it was considered, by many sensible persons, to depend on the damage which the rice (the ordinary vegetable aliment of the Asiatics) had sustained. This idea, however, was rejected, as absurd, by many very learned and eminent men, some referring the disease in question to electrical changes in the atmosphere, others to filth, and others to intemperance, &c., &c., &c.

It seems reasonable, however, to suppose, that, when a disease prevails generally, its cause must be a general one. And when we meet with it especially among a certain class of people, and not so especially in another, we are instinctively led to inquire, what

cause especially operates among one class of society, and not so especially in another. The atmosphere, all breathe, and must breathe. If, therefore, the cause were in the air exclusively and generally, none could escape the disease. The operation of electricity, to say the least of it, is as general as that of the atmosphere; so that what I have said of the latter, applies also to the former.

Now the cholera, with very few exceptions, is found to affect the poor—those who, by reason of their poverty, cannot afford to live on animal food, and are, therefore, under the necessity of contenting themselves with such an allowance of vegetable aliment as they can afford to purchase. Those who are best acquainted with the condition of the poor in this country, can best say whether what I state be correct. All I can say on the subject is, that, as far as my own observation extends, I am conscious of stating nothing but the truth.

If these remarks be correct, (and I think they cannot easily be shown to be false,) it stands to reason that the poor, being accustomed to the use of vegetable aliment, cannot have that aliment deteriorated in quality, or diminished in quantity, without being seriously inconvenienced by such events—so great is the influence of habit. Accordingly, we find, that whatever causes tend to reduce the quantity, or deteriorate the quality of corn and

potatoes, (the two principal articles of vegetable aliment in this country,) are productive of the greatest physical suffering, and, frequently, of severe disease among the poor. And I think, if observations were carefully made, that both the typhus fever and the cholera, would be found mainly to depend on these causes.

Vegetable aliment, however, is well known to abound in acid, while, on the contrary, animal food yields alkaline matter. Now physiologists are aware, that a due supply of oxygenised blood, (which abounds in the principle of acidity,) is essential to the nutrition and consequent healthy irritability of the human frame.

Again, the quality of the blood, is much influenced by the nature of the food, of which any one habitually partakes. And it is a fact, that a man fed on animal food, is not so capable of enduring continued hard labour, particularly in warm weather and warm climates, where the air is rare, and, consequently, the same volume of it being exhaled, does not supply so much oxygen to the system, as in cold climates, and cold weather in temperate climates, where and when it is dense. From these remarks, it follows, that a due proportion of vegetable food, tends to maintain the healthy irritability and consequent activity, not only of the system generally, but also of the individual organs, and



more especially, of the heart, arteries, and capillary system.

Now this is the very system, and these the identical organs, which are primarily disordered in the Asiatic cholera; the disorder of any other system or organs, being only consequent to, and dependent on, derangement of them.

But it has already been suggested, that, most probably, the disorder of these organs, and of this system, consists in loss of their healthy irritability; whence they are unable to circulate the blood; which, therefore, stagnates in the capillary vessels, large arterial trunks, and the heart; oppressing, in fact, the brain and lungs; and thus, at once, accounting for the great prostration of strength, and diminution of animal heat, so remarkable in this disease.

To any one at all acquainted with the phenomena of sea-scurvy, typhus fever, and epidemic yellow fever, it will be evident, that there is a great general similarity between these diseases and Asiatic cholera. There is no doubt that these diseases were considered, by all the most intelligent physicians of the last century, to be essentially putrid disorders; and they agree in considering acids as the proper remedy for them.

Moreover, Dr. Stevens, of the island of St. Croix, in the West Indies, and my friend, Dr. De Castro,

of the city of Havana, both very eminent and intelligent men in those places, enjoying first-rate opportunities of observation and investigation, have declared,—the former, that the blood of patients affected with the epidemic yellow fever, being chemically analysed, is proved to possess decidedly *alkaline properties*—the latter, that it is in a state of *incipient decomposition*.

But it must be evident to every practitioner of medicine, that the blood drawn from a patient affected with an inflammatory disease, is of a very different appearance from that which is taken from the arm of a person labouring under a reputed putrid disorder. For instance, the blood of a person affected with synocha, is generally inclined to be of a florid colour, with a cupped and buffy surface, consisting of a firm clot, surrounded by a fair proportion of serum. On the other hand, that which is drawn from a person affected with typhus fever, is usually of a dark colour, inclining to black, wanting the cupped and buffy surface, consisting of a soft clot surrounded by a small proportion of yellow serum. This is the character of the blood drawn at the commencement of the disease. If, however, blood is drawn at a later period, it will present a black dissolved appearance, like hot pitch, or thick ink, without any defined clot or distinct serum.

In an inflammatory disease, it is therefore evident, that the blood has more the character of arterial—in a putrid or congestive disorder, it has more that of venous blood. Now we know, that arterial blood is indebted, for its peculiar properties, to the presence of the principle of acidity; but that venous blood, on the contrary, owes its peculiar properties to the absence of that principle.

If, now, we regard the remedies which have been most celebrated for their efficacy, in the cure of typhus fever, yellow fever, cholera, sea-scurvy, &c. we shall find, that they are all of such a nature as are capable of supplying, if not acid, at least a principle of acidity, to the blood. These are calomel, the vegetable and mineral acids, acescent fruits, wine and other fermented liquors, whey, effervescing saline draughts, neutral salts, the cold affusion, and cold ablution, fresh air, &c., all which, it must be evident to any one conversant with chemistry, contain either oxygen or chlorine, both acidifying principles.

If I have explained my ideas as clearly as I hope I have done, it must already have been perceived by the attentive reader, that I consider the epidemic or Asiatic cholera to depend on a deficiency of the acid principle in the blood. This idea is not, however, the vain offspring of an ungoverned imagination; but, I trust, I have shown, that it is the legi-

timate result of correct reasoning, based upon facts, recorded by the most distinguished men in the medical profession, confirmed by my own personal observations, during more than fifteen years experience in the practice of medicine, both in tropical and temperate climates.

From what has been said, the mode of treatment, which I have to propose, and which is the cause why I have ventured to trespass so long on your attention, will naturally result. This must consist of three agents—two of which are calculated to relieve the most pressing symptoms, prostration of strength and pain—and the other strikes at the root of the disease.

It is evident, however, that unless the means employed in the treatment of this disorder, are within the reach of the majority of persons, it will be of little avail to the poor—for whose benefit this treatment is especially intended.

Gin, then, must be given in order to produce reaction; tincture of opium, to allay pain; and lime or lemon-juice, common vinegar or citric acid, to remedy the depraved state of the blood—on which all the symptoms depend; and which, being removed, these will vanish like “the baseless fabric of a vision.”

Great care, however, must be taken not to give these remedies in excess, otherwise they will do

more harm than good ; for they are decided means, and must be used with great judgment.

The dose must, therefore, be proportioned to the age, sex, temperament of the patient ; and the severity of the disease. To a child eight or ten years old, I would advise giving from half a teaspoonful to a teaspoonful, each, of gin and vinegar or lemon-juice, or from  $2\frac{1}{4}$  to  $4\frac{1}{2}$  grains of citric acid, mixed with from 4 to 8 drops of tincture of opium, and a tablespoonful of hot water, to which a little sugar should be added. This dose to be repeated every second or third hour, or sooner or later, according to the urgency of the symptoms.

To a delicate adult female, or a robust youth from twelve to sixteen years old, a dessertspoonful of gin, and as much of either of the acid ingredients last specified, mixed with a couple of tablespoonfuls of hot water, and from 10 to 20 drops of tincture of opium, to which add a little sugar. This to be repeated at intervals of two or three hours, or oftener or less frequently, according to the intensity of the symptoms.

A robust female, or delicate adult of the opposite sex, will bear a tablespoonful of gin, as much vinegar or lemon-juice, or 18 grains of citric acid, mixed with 4 tablespoonfuls of hot water, and 20 or 30 drops of tincture of opium, a little sugar being commingled. This should be administered at intervals

of one, two, or three hours, in proportion to the severity of the case.

A very robust adult male, accustomed to the use of spirits, fermented liquors, &c., may take double the quantity of these ingredients, at intervals of one, two, or three hours, according to the urgency of the case.

The patient must be, in all cases, kept warm with blankets during the stage of collapse : and it will be sometimes necessary to apply sinapisms, hot bricks wrapped up in cloths, or bottles containing hot water, to the pit of the stomach, the palms of the hands and wrists, and the soles of the feet—general friction on the surface of the body, with hot vinegar, to which mustard may be sometimes added, should also be resorted to in very severe cases. The efficacy of the vinegar for internal use, will be enhanced by dissolving nitre in it, in the proportion of half an ounce of the latter to half a pint of the former—of which solution the same quantity may be given for a dose, as is above recommended, in reference to common vinegar.

Notwithstanding the care with which I have endeavoured to prescribe this popular treatment ; and the caution which I have inculcated in the use of it ; still much must be confided to the judgment, discretion, and kindness of the attendants. But I feel confident, that, in the event of our being



visited by this dreadful disease, if the means which I have recommended, be judiciously employed, in humble dependence on the Divine Blessing, they will be found generally successful. And although the simple means which I have suggested, will be found to be very applicable to the case and circumstances of the poor ; yet I do not mean to undervalue or detract from, the efficacy of those remedies which are within the reach of the wealthy, and have been employed with so much success by the most eminent physicians and surgeons — viz. Calomel, the warm essential oils, brandy, wine, camphor, blood-letting, blistering, the warm bath, &c. &c. &c. As these remedies, however, are never employed without the most decided good or evil effects, they should never be administered except under the control and direction of intelligent members of the medical profession, or other persons skilled in their virtues and uses.

I am far from supposing that I have fully and minutely reviewed the subject of cholera in these hasty observations—that is a pleasure which I may be permitted at some future period, in a work deliberately devoted to the consideration of medical subjects—but I feel my mind relieved from the responsibility of confining these ideas to myself, under existing circumstances and expected events, by giving publicity to this letter.

I now implore the blessing of the God of Nature and of Grace, the Lord Jesus Christ, on whatever of truth or goodness may appear in these remarks, to the blessed influence of whose Spirit I attribute them. He is the efficient doer of all things in Heaven and Earth. He sends diseases to reclaim men from their evil ways. He wounds that he may the more effectually heal. He casts down that he may the more eminently exalt. To Him therefore, and not to the princes of this world, be glory, honour, and praise everlastingly. Amen.

I am, Dear Friends,

Yours faithfully,

DAVID M'CONNELL REED,

Licentiate of Medicine,

&c. &c.

11, *Queen's Road, Norland Square,*  
*Notting Hill. May 21st, 1846.*

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P. S.—Part of this Letter was sent to the Editor of the Times for insertion in that journal: but he did not condescend either to notice or comply with the writer's request to give it publicity. A fortnight has since elapsed; and although the report which

was the immediate cause of its being written has proved to be incorrect; and some of the observations which it contains, apply exclusively to the weather at the time it was written; yet on revision of it, the writer sees nothing material to alter. The present extreme heat of the weather and its results, only confirm him in the opinion which he has expressed respecting the invasion of the cholera, if not earlier, at least during the autumn.

He will here, however, notice a few facts which he has personally witnessed. During the year 1837, 38, or 39, (which, he is not certain,) when he resided in the Island of St. Domingo, there was a great dearth, which destroyed vegetation generally; and, at the same time, there was a blast or rot which affected the fruit trees. The heat of the weather was extreme; the air, when inhaled, did not seem to refresh or cool the system; and there was a great scarcity of vegetable food. The lower animals first fell victims to this visitation. Horses, mules, asses, and dogs, &c. sickened and died. Next to these, persons who had been for some time previous affected with chronic diseases, were carried off. Then men, women, and children, hitherto enjoying good health, were afflicted with a most painful cu-

taneous affection ; the writer, also, was affected with this. It was attended with extreme irritation, and a burning sensation of the skin, very difficult indeed to bear ; which was succeeded by an eruption of miliary vesicles, followed with scabs. The irritation, which was excruciating, continued even after the vesicles and scabs had made their appearance, and was most difficult to subdue. What proved most efficacious, however, were, abstinence from stimulating food and drink ; the observance of a farinaceous and cooling diet, together with a liberal use of saline and acid draughts ; bathing in tepid water ; and the application to the surface, of a lotion composed of acetate of lead, and the aqueous solution of opium.

Those who suffered from the cutaneous affection, generally escaped the malignant fever ; which followed as the season advanced ; and swept the miserable inhabitants away, particularly the poorer and more profligate and improvident classes of them, in great numbers.

People were attacked with this disease, and cut off, in an incredibly short space of time ; and that, in many instances, without remedy.

At the time that this epidemic was prevailing throughout the Island of St. Domingo, and particularly at Port au Prince, the cholera was reported to be making its usual ravages at the Havana ; and

the yellow fever, at Demarara, Berbice, and other parts of the West Indies.

It was at this time, that the wife of R. E. Hodges, Esq., her Majesty's consul at Jaemel, but lately arrived from England, who had been previously attacked with the cutaneous affection already alluded to, fell a victim to eating a slice of melon at mid-day and taking a tepid bath afterwards. My friend Dr. Daly, who attended her, told me, that she died of a low nervous fever,—a very unusual complaint for a European to die of, in a tropical climate. Her disconsolate husband was so acutely affected by her untimely death, that he had her remains embalmed and sent home, to be deposited, I believe, in the family vault. Dr. Daly conducted the process of embalming, and the body reached England in such a perfect state of preservation, as to elicit the eulogiums of his medical brethren, on his superior skill in this department.

Mrs. Ussher also, the wife of T. N. Ussher, Esq., her Majesty's consul at Port au Prince, and, if I recollect rightly, some of the children, suffered from the cutaneous affection; but the nursemaid, an English girl, was attacked with the fever, from which, though very severe, she eventually recovered. Many other foreigners of distinction in that country, fell victims to the epidemic in question; as instances of which fact, I shall mention the names of Judah

Lord, a foreign consignee merchant at Jacmel; Mr. Swinchzer, a partner of the mercantile firm of E. Loyd, & Co. at Port au Prince; and my friend A. N. Sewell, Esq., a partner of the house of John Hearne & Co., also at Port au Prince, was severely attacked, but recovered. His wife, however, attended by a French physician, was attacked, after giving birth to a child, and died in less than twenty-four hours, while the unconscious husband was quite unaware of the sad catastrophe. Nor did I think it consistent with the safety of his life, to allow the fact to be communicated to him, until he had so far recovered as to be out of immediate danger.

This dearth, however, as is usual with respect to dearths generally, was preceded by a very wet year.

Now let us refer to the extremely wet spring and autumn, which prevailed last year; also to the peculiarly mild and damp winter, which we have just passed; together with the cold and changeable weather which characterized the recent spring; and, comparing these with the very sultry weather which now prevails, and has every prospect of continuing, let any candid meteorologist say, whether my opinion respecting the invasion of the cholera, or some other malignant disease this autumn, rests on slight grounds.

Rut although I reason thus, from natural causes to natural effects; (and who is prepared to say that



I do not reason correctly ?) yet I know, that good is commensurate with evil, in nature ; nay more, that there is a power, on earth, to open and shut heaven, and to turn away impending danger. This power, however, cannot be brought into operation, until men's eyes are opened to the approaching evil ; and feeling their utter helplessness, they are induced to have recourse to it. This power is vested in the Church ; and is the efficacy of faithful prayer ; of which this nation, when in perplexity, has frequently reaped the benefit.

I sincerely hope, that, in the present instance, my apprehensions will prove visionary. If they do, however, I shall know to what cause to attribute the fact.

DAVID M'CONNELL REED.

*Queen's Road, Norland Square,*

*June 5th, 1846.*

# I N D E X.

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## ERRATA.

- Page 8, line 17, *for bronchi, read bronchial tubes.*  
11, — 8, *before the word irritating, insert quality of the.*  
33, — 9, *after pulmonary, insert or.*  
61, — 19 & 21, *for excessive read increased ; line 20, omit the words, and by consequence become torpid.*  
80, — 22, *for reassuming, read resuming.*  
95, last line, *for irritability, read inirritability.*  
96, line 4, *before increased, read on instead of an.*  
116, — 22, *for minds, read mind.*  
205, — 23, *for Nasographiæ—Phylosophicæ, read Nosographiæ Philosophicæ.*  
206, — 8, *for livius, read lividus.*

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